Review of Research in Visual and Environmental Education

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Review of Research in Visual and Environmental Education

RRVEE is published cooperatively by the office of Continuing Education and Public Service and the Department of Art and Design, University of Illinois.

There have been some changes in the current issue which are worthy of discussion. The most obvious change has been in typography. An IBM Selectric Composer which provides a more professional typographical quality has been made available to RRVEE. The basic type font used in this issue is Aldine Roman 10 Pt. Medium.

A less obvious, but clearly more important, change includes the appointment of an editorial board. Since the inception of RRVEE nearly two years ago, the editors have had the need to informally seek the opinions of colleagues regarding editorial policies. However, as the content and readership of the review have expanded, the editors felt that it would be advantageous to have a more formalized consultative arrangement. In our view, the present editorial board is comprised of individuals who have demonstrated a professional involvement and expertise in the area of visual or environmental education that is consonant with the direction of RRVEE.

A content change in this issue includes the addition of a new section entitled: Dissertations Reported. The purpose of this section is to provide the readership with a listing of doctoral dissertations which have been recently completed in the areas of visual and environmental education. Dissertations listed in this section have been reported in *Dissertation Abstracts* during the period of January through June, 1974, and were identified by using the following key words: aesthetic, affective. appreciation, architecture, art, artistic, attitude, creativity, curriculum. education, environment, preference, and psychology. The next issue of RRVEE will complete the listing for the period of July through December, 1974.

Finally, due to an increase in postal rates, we are in the process of updating our mailing list by asking each reader who wishes to receive future issues of RRVEE to complete the self-addressed enclosed card and return it as soon as possible. With the exception of libraries, the mailing list for the next issue of the review will be made up of cards that are returned to the editorial office. Please note that the names of those individuals now receiving the review who do not return the enclosed card will be dropped from the mailing list.

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CHILDREN'S ABILITIES TO FORM AND GENERALIZE VISUAL CONCEPTS FROM VISUALLY COMPLEX ART

Gilbert Anderson Clark, Ph.D.
Stanford University, 1972

ABSTRACT

Though art education has claimed the education of acute observation as a goal, no empirical evidence has been developed to indicate that this goal has or can be achieved. Art educators experimenting with history, criticism, and aesthetics in art curricula need data on visual observation in the learning of art-related concepts.

Following a pilot-study conducted in secondary schools, 275 subjects were administered 20 Visual Generalization Displays (VGD). Students in two kindergarten, third grade, and sixth grade classes and an equivalent number of students in grades nine and twelve were tested. Subjects examined sets of six visually similar art reproductions and were instructed to identify similarities. They were then shown three additional reproductions and asked to select the one that was visually most similar to the set previously observed. For ninety-three subjects the test was administered orally; the resulting discussions were tape-recorded. Eighty-nine subjects were subsequently administered 20 Visual Concept Formation Displays (VCF). These subjects examined sets of nine reproductions and were instructed to identify seven visually similar reproductions.

Evidence gathered indicated that students at all grades are able to form visual concepts from observation of art reproductions. VCF test scores and the tape-recorded administrations of VGD indicated some success in concept formation by most subjects. Evidence gathered also indicated that students are able to generalize visual concepts. All subjects scored above the chance level and scores showed successive improvement from every grade to the next on the VGD. These findings parallel similar findings reported for other types of related research.

Analysis of the tape-recordings indicated that subject matter, color, and the style of art reproductions account for 73% of the subjects' verbal references to attributes. Subjects frequently referred to obvious attributes and infrequently to subtle ones, though both are equally important for successful learning from observation.

Analyses of transcriptions yielded the following: 1) Responses increase in complexity in successive grades though they show little qualitative improvement. 2) Most attribute references consist of naming the attribute. 3) Primary grade subjects made one verbal attribute reference per item, and sixth, ninth, and twelfth grade subjects made three to five references per item. 4) At all grades many responses were unsure or questioning. 5) The easiest displays triggered the most verbal responses, and difficult displays elicited silence or tentative verbalization by most subjects. 6) Of 1,445 transcribed comments only 2.8% contained specific art vocabulary and nearly 10% of this vocabulary was used incorrectly.

Chi-Square tests of differences showed a significant relationship of test scores to grade level for 70% of the displays. However, kindergarten to third grade differences accounted for most of this effect. Subjects' age, SES, IQ, and sex were not significantly related to scores beyond chance expectations.

Reliability indices (Cronbach's alpha) were below minimum standards for tests used to evaluate individual performance. Low item intercorrelations and insufficient test length were factors in this finding. Additionally, school's inattention to the abilities tested may account for the low reliabilities obtained. Scores on the two tests were significantly correlated ($r=.38$; $p \geq .01$) for 89 subjects.

Additional identification of appropriate visual concepts and research on teaching techniques for observation skills are needed. It is recommended that further revision and pilot-testing of similar research displays be conducted. Other research is also suggested. Eye-movement on the displays fell into patterns and subjects imposed a temporal pattern on their examination of the displays. Are there significant correlations between eye-movement, temporal pacing and test performance? Is the independence of observation skills and IQ a replicable finding? Use of the research displays was not accompanied by additional tests. Is performance in observation correlated with other quantifiable student characteristics?

This investigation has demonstrated that public school students can form and generalize visual concepts from visually complex art reproductions. A research area that can inform the effective design and implementation of art curricula, especially those planned to educate the observation skills necessary for understanding the visual arts, has been identified.

REVIEW

Mary J. Rouse
Indiana University

The major difficulty of this dissertation is that it did not adhere to rather standard research models. Had the writer, Gilbert Clark, chosen to follow such a model he might well have been prevented from committing some of the errors which appear in the final report. Sometimes such models seem impossibly 'old hat' to young researchers and they choose to be more 'creative' in format only to find in the end (as was the case here, I think) that the traditional model has a kind of built-in logic, with consequent 'fail-safe' procedures, that they could not perceive earlier.

The traditional model I am referring to is the common proposal and research report format that most universities and funding organizations prefer. In this format, there is first of all a statement of the 'problem,' a rationale for its significance, a theoretical or conceptual statement that seeks to unite many ideas into a coherent structure out of which can be logically projected hypotheses which test it, questions which might be asked and answered about it, and a set of objectives by which these can be resolved. There is also usually a review of related literature, a clear explanation of procedures to be used in the resolution including a plan and rationale for sampling the population, a plan for developing and utilizing the necessary instruments for the resolution of the problem, a rationale for the kinds of data analyses to be used, and a statement concerning the levels of significance that will be accepted as evidence. The final report almost always also includes a statement of the results that have ensued from the analysis, logically connected to the hypotheses or questions asked, a section that attempts to draw conclusions and generalizations from the findings, a discussion section, and finally, a list of implications and recommendations that the author makes on the basis of what has occurred. Most such models place the various segments more or less in the order named simply because this is an extremely logical flow.

But Clark did not follow such a model. Instead, he forces the reader to jump around from chapter to chapter in an attempt to discover the pieces of the puzzle, both before and after the fact. Such a dislocation of logical order reflects itself in a number of problems which might not otherwise have developed. Let me illustrate.

The usual Chapter One contains a discussion of the problem, a significance statement, the theoretical/conceptual structure, hypotheses and/or questions, objectives, and a few other minor additions. Clark's Chapter One, however, is entitled 'Art Education and the Education of Visual Observations' and is probably intended to be a kind of background and theoretical /conceptual statement in entirety since he reserves his Chapter Two for 'The Problem and Development of the Visual Displays.' As a matter of fact, his Chapter One does contain the problem statement although Clark may not recognize it as such, while his Chapter Two does not. His Chapter Two 'problem statement' begins, 'This investigation was designed to study children's responses to the tasks of forming and generalizing visual concepts on the basis of observed visual similarities... .' Importantly, as David Clark and Egon Guba have emphasized (4) this is not a problem statement; rather it is a statement of purposes and the two should not be confused. For a 'problem' to exist, there must be a quandary, a dilemma, or an opposing point of view which leaves the outcome in doubt. As a matter of fact, Clark set up just such a dilemma for us in Chapter One when he wrote,

> *Some writers believe children are only cognizant of displayed attributes which they have previously experienced and been trained to observe for which they have an appropriate vocabulary. If these are the only bases for knowledgeable responses to observations the visual act cannot be an immediate or direct means of learning. Other writers have suggested, however, that learning can result directly from observation experiences. Thus an important research question is raised: is it possible to demonstrate the learning of visual concepts by children as an immediate consequence of their observation of visually complex art reproductions? (5)*

Now that is a problem statement, and a very adequate one. Had he followed this statement by the usual hypotheses or questions and objectives his first chapter would have been completely logical, since he also included an excellent theoretical argument. But the other portions were lacking.

The traditional Chapter II usually includes something called a 'review of relevant literature.' But Clark, instead, chose to devote his second chapter

to a statement of purposes, as I have shown, and some 23 or 24 pages of discussion of how he developed his instrumentation. That kind of discussion properly belongs in a procedures chapter; certainly not here. And, while he did include part of a review of literature in his theoretical discussion in Chapter One, his study badly needed a whole section devoted to what would be a much more extensive overview of the literature. 'Reviews of literature' serve several good purposes and at least one of these could not be accomplished by the sharp selection necessary in the construction of a theoretical argument. By this I mean that a review of literature should tell us not only what we need to know to understand the theory from which the researcher draws his or her hypotheses and objectives but it also has two other very important purposes which are sometimes ignored at the researcher's peril. These are: (1) to inform the reader of the prior history of research of which this particular study forms but one part, and (2) to provide the reader with the necessary information to decide whether the researcher had consulted all of the major sources which might touch in some way on the subject at hand. An informed reader can tell much about the range and recency of the researcher's informational base simply by scanning the names presented in this section.

This writer has often observed the dire results that can result when a doctoral student has not literally 'submerged' himself or herself in the relevant literature prior to beginning a study. Often such a complete review clearly indicates directions that should either be followed or avoided at all costs and there is also the added advantage of complexity and richness such a practice affords the study - always a mark of true scholarship.

Since Clark did not provide us with such a review, I was forced to turn to his theoretical discussion to gain an impression of the validity of the sources he had consulted. This inspection showed that several possibly important avenues had not been explored, and also, that a majority of his citations were from secondary sources rather than the more preferable primary ones. In fact, only 13 or 14 citations out of a total of 73 for the entire dissertation could be considered primary in nature. Thus Clark was forced to rely on interpretations others had given to still other sources to which he himself had not had access - sometimes a dangerous procedure. Many of the primary sources on children's responses to aesthetic objects

which he might have consulted had he adapted the usual stance toward a 'review of literature' did not appear in the theoretical discussion and therefore, did not enter into his research strategy. Names such as Child (3), Janes (6), Burt (2), Valentine (17), Sigel, Jarman and Haniesian (15) and others of an equally important nature simply do not appear and that is unfortunate. Janes's work would have been especially relevant to his study since in her exploration she had presented children with sets of visual aesthetic stimuli and asked them to choose the two from each set which they thought were most similar and to tell why they made such choices. Their responses were tape recorded and later classified according to a conceptual categorization system devised by Sigel *et al*, as either 'descriptive-global,' as 'descriptive-part-whole,' as 'relational-contextual,' or as 'categorical-inferential.' Sigel *et al's* system could have provided Clark with an already explicated and researched set of categories into which his taped responses might have fitted nicely, but alas, both Janes and Sigel seem to have gone unnoticed by Clark in his limited reading of available primary material.

Another problem with the literature was that much of it that was used in his discussion of concept attainment was rather dated; few are even as recent as the 1960's. Had his reading been more up-to-date, Clark might well have discovered some highly relevant information about the existence of 'high visualizers' or 'high imagers' (the terms seem to be interchangeable) as well as 'low visualizers' or 'low imagers' - that is, those individuals who think primarily in terms of iconic images or primarily in terms of verbal symbols. In a study such as this one, such differentiation would seem to be an important independent variable to be considered when sampling and testing. Alan Richardson's book, Mental Imagery (11) existed in 1969 prior to the completion of Clark's dissertation and should have been consulted. Allan Paivio's new book Imagery and Verbal Processes (9) of course did not but the sources from which he drew his information did and should have been looked at. Art educators can no longer ignore the important body of material by such writers as Brown (1), McKellar (7), Paivio (8), Reyher (10), Roe (12). Schmeidler (13), Sheehan (14), Slatter (16), and a host of others whose work clearly indicates the existence and importance of such substantial differences in visualizing and imaging, and types of behavior necessarily related to individual differences in response to aesthetic stimuli.

Another major problem was with Clark's failure to specify early (preferably in Chapter One as I have already pointed out) the hypotheses or questions, and objectives that his study would seek to resolve or accomplish. Perhaps Clark thought that something of this nature was being achieved when on page three he wrote:

> *Public school students in the kindergarten, third, sixth, ninth, and twelfth grades were shown two types of research items. In that procedure, subjects were shown displays of nine reproductions. They were asked to find seven visually similar reproductions and to eliminate the remaining two. In another procedure, subjects were shown displays of six reproductions... .*

But these statements cannot be construed as either objectives or hypotheses. Rather, they are descriptions of *procedures*, and further, were stated in the past tense (as having already taken place) rather than in a more conditional phrasing as is appropriate to a first chapter. Nowhere in the dissertation, in fact, can we find statements which might be regarded as research hypotheses. Of course, research hypotheses are not always necessary. Studies utilizing a factor-analytic process rarely find them appropriate and almost never use them and even in studies where they might be perfectly appropriate, well stated questions can sometimes be used instead. But in the latter case, these should certainly be present early in the discussion, and they should be translated (as should the hypotheses) into explicitly stated, tightly worded objectives which will give both the reader and the researcher a plan for understanding what is going to happen in the testing procedures. Along with this should always be a statement of what the researcher is prepared to accept in terms of levels of significance. No such means were provided in this study.

Instead, in Chapter Four, 'Findings of the Investigation,' one finds that Clark has indeed constructed such a set of questions which he has sought to test and against which he compares his findings. But Chapter Four is too late to wait; this material should have appeared much earlier. As I have already stated, adherence to a traditional research format would have insured that these questions appeared earlier and in the proper logical sequence. Nowhere, however, does Clark state which levels of significance he thought necessary for acceptance or rejection of the research data. We

learn that only after the fact and are left in some doubt, even then, as to why he thought these levels of acceptance were adequate or not. In a descriptive study such as this, some such prestructuring is vitally necessary and the lack of it is a major flaw.

One wonders, too, about the lack of 'hard-nosed' statistical procedures used to answer the questions, once stated. Admittedly, most of the data collected turned out to be non-independent, and therefore, not accessible to analysis by standard parametric procedures. But certain non-parametric tests can handle this kind of data and should probably have been used. This does not mean that Clark does not use any kind of analysis, but rather, that he leaves us hanging in mid-air on some of the questions he asks, and forced to rely on his own conclusion that 'this figure is meaningful' and 'this one is not,' without providing us with the means to draw our own conclusions. With respect to Question One, which asks 'Can children form a visual concept by observing similarities in a selected set of art reproductions?,' he analyzes their scores on the Visual Concept Formation Display by comparing class means with chance expectations - probably an adequate method. Similarly, he answers Question Two by the same method, 'Can children generalize a visual concept by applying observed similarities among art reproductions to a previously unencountered example?' However, when he comes to analyzing the findings relative to Question Three, 'What attributes of visually similar art reproductions are most frequently noted by children?' he provides us with an answer stated only in terms of general percentages. Percentages are perfectly acceptable, but there are tests which can make some statistical sense of percentage comparisons and he should have used them, but did not. The same thing occurs with respect to Question Four, which asks, 'What is the nature of children's verbal responses to the task of classifying observed visual similarities of selected sets of art reproductions?' Here he attempts to provide answers by loosely describing the responses of the children as merely 'descriptive' or as 'identification of similarities.' It is here that Sigel's system of explicit categories could have provided him with an analytical tool which would also permit statistical comparison. Clark's method relies on a descriptive, contextual-type of discussion which of course is important and could have formed an important complement to a more quantitative type of assessment technique. But contextualism, no matter how detailed, can never provide us with the kinds of data and analysis we need for decision-making in the same way that suitable statistical techniques can.

With respect to the fifth question, 'Are the abilities to form and generalize visual concepts a function of grade level, socio-economic-status (SES), age, IQ, or sex of the subject?,' Clark uses a Chi Square analysis to analyze the grade level, but unspecified tests of independence for the variables of age, SES, IQ and sex. He writes about 'significance' with respect to those variables, but does not tell us how he arrived at his assessments of whether the results were acceptable or not. Again, this lends credance to my prior argument for following traditional procedures because those would have insisted on better procedures.

One final word needs to be written concerning procedures. The type of sampling used for the main study - a kind of cluster procedure with interior randomness - employing children in the kindergarten, third, sixth, ninth, and twelfth grade levels from the school system of Livermore, California, is usual and probably about the best that can be expected given the usual circumstances of school-district imposed limitations. However, a pretest attempted to validate the two tests to be used in the main part of the study and this validation procedure involved only students in junior and senior high schools. Since prior studies about children's abilities to visualize, or conceptualize, or make evaluative judgments, or comparisons point to so many possible areas of developmental difficulties with children in the elementary schools (indeed, most of the major difficulties that are seen usually occur during grades K-6) it seems very strange that the pretesting did not include any children from those age groups. Small wonder that some parts of the tests did not appear to be valid in the final study.

Despite all of the procedural difficulties discussed, the study was enlightening and provided us with some useful insights into the whole question of children's abilities to form visual generalizations - an area that badly needs more exploration. However, a more carefully structured approach to both planning and reporting procedures at every step along the way would have provided the study with a strength it does not yet have. We know more than we knew before we read it, but it is possible that we could have gained still more information from the same amount of effort.

Mr. Clark writes very well and obviously invested a great deal of time and effort on this undertaking. Given his obvious intelligence, and the fact that this was a doctoral dissertation, one is forced to conclude that many

of his difficulties were caused by a lack of guidance on the part of his doctoral committee. Since this writer graduated from the same institution, but had almost an opposite kind of experience at the dissertation stage, she feels perfectly justified in commenting on this. Surely the institution that is consistently rated as the top school of Education in the country ought to be able to give first-class students more help than this.

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REVIEWER

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ANALYSIS OF AESTHETIC-COGNITIVE RESPONSES OF UNDERGRADUATE STUDENTS TO PAINTING COMPOSITIONS

Helen Marie Diemert, D.Ed.
The Pennsylvania State University, 1972

ABSTRACT

Area of Investigation

The purpose of this investigation was to study the differences between sophisticated and naive students in their preferential, discriminative, and descriptive responses to painting reproductions in order to probe into the effects of art learning. Differences in the responses of the two groups were attributed to the results of art learning. Answers to questions pertaining to the nature and dynamics of aesthetic preferences, the size of clusters when grouping painting compositions according to commonalities, the criteria used to form categories of paintings, and the interrelationships among preferential and classificational responses were sought.

Procedures

Twenty-four undergraduate students--12 sophisticated and 12 naive--were the subjects. Biographical information was tabulated for an experiential background measure. Two sets of procedures were used to collect data on two occasions. They consisted of ranking 48 small reproductions of paintings into a preference array, describing the two extreme preferences, sorting the painting compositions into groups based on commonalities, attaching captions to each group, and selecting and describing both a matching and a contrasting pair of compositions. Eight descriptive variables were analyzed and comparisons between the groups were made. The eight measures were response strength, the two extreme preferences, category discrimination, and three types of cognitive style (descriptive, interpretive, and associational).

An educational treatment consisting of three teaching protocols (extrinsic, intrinsic, and subjective emphases in the study of painting compositions) was administered to three experimental groups. Through analysis of covariance, the effects of the treatments on the preferential rankings were analyzed on the basis of 30 descriptive subsets of stimulus items.

Main Results

Preferences of the sophisticated students were characterized by a broad range of abstraction, historical periods, artistic styles, and themes. They were considerably more abstract and more highly appealing than preferences of the naive subjects. Naive students preferred realistic art works and rejected highly abstract compositions. Verbal responses from the sophisticated students were more numerous and articulate than were those from naive students. They were characterized by a precision, breadth, and knowledge of terms or acquired vocabulary.

The teaching treatments had the effect of levelling the differences in preferential rankings between the sophisticated and naive groups. They also had a positive, influential effect on the cognitive style of the three experimental groups.

Implications

The sorting tasks used in this study were designed to stimulate cognitive operations in the visual, aesthetic realm of experience. They involved the discriminative activities of selective attending, comparing, hierarchical ordering, categorizing, and valuing; and they exemplified a method of relating art to general learning. Writers such as Ausubel and Bruner have challenged educators to use each discipline for building intellectual skills. Art studies seem eminently appropriate for promoting cognitive behaviors in the realm of visual and symbolic information processing. Art curricula, enriched and strengthened with instructional emphasis on visual thinking or the building of meaningful, mental structures, ought to provide an important avenue to intellectual growth. Results of this study imply that art learning is characterized by the exercise of active, exploratory, perceptual behaviors and the acquisition of a meaningful vocabulary of visual, aesthetic terms.

REVIEW

Michael Day
University of South Carolina

Statement of the problem. The study is set in the broad context of inquiry into cognitive processes in art learning and focuses primarily on differences in responses of artistically 'sophisticated' and 'naive' college students to a selection of art reproductions. Research questions, rather than stated hypotheses, describe the specific intent of the study:

1. How do sophisticated and naive students differ in their relative preferences to selected reproductions of paintings?
2. How do sophisticated and naive students differ in their categorization of painting compositions?
3. What are the effects of three teaching protocols, namely, extrinsic, intrinsic, and subjective emphases, on the preferential and cognitive responses to painting compositions by sophisticated and naive students?
4. Are there any significant correlations among the preferential and discriminative responses of sophisticated and naive students before and after teaching treatments? (pages 3, 4, 5, including twenty more specific questions)

At this point the question enters the readers mind. 'So, what if interested art students respond differently to art works than others? The same is true of model airplane buffs with respect to model airplanes.' The answer is that the author has utilized numerous constructs, such as response strength, category discrimination, cognitive styles (3), historical continuum, etc., in order to perform a detailed statistical analysis of the differences between sophisticated and naive viewers of art. It was the authors intent that this analysis might 'provide clues to the nature of cognitive learning in art.' (p.3)

Related research. Chapter II is a review of two types of studies, the first dealing with various aspects of art preferences, and the second dealing with relationships between cognitive learning and visual aesthetic perception. This chapter is handled competently, including references to several related technical devices such as multidimensional scaling, object sorting, and category width as a measurement of discrimination.

Important issues, such as relationships between aesthetic preferences and personality attributes, effects of teaching practice on aesthetic judgment, relationships between affect and cognition, and the use of language as an influence on art learning, are concisely reviewed in this chapter. Although the author does not explicitly discuss connections between cited literature and the investigation, the relationships become obvious through further examination of techniques, constructs, and procedures.

Methodology. The study presents examples of clever, interesting methodology as well as clearly inadequate practi ce. The sample of population for this study consisted of 24 undergraduate students, 12 labeled

artistically 'sophisticated' as members of a senior art course, and 12 labeled artistically 'naive' as members of two sections (6 in each) of a junior level art course. No information regarding age, sex, major in school, mental maturity, or other possibly pertinent factors was included in the study. Nevertheless, the sophisticated (S) group is compared with the naive (N) group throughout the report, even though the sampling was not random.

For the descriptive portion of the study three measures were administered. The first is a questionnaire designed to determine levels of art experience. It includes three categories: 'The individual scores from education, attitude, and involvement were totalled for a single score of experiential background (EB).' (p.33) No validation information is presented regarding the questionnaire. Comparison of EB scores by S and N students indicates the nine highest naive students scored higher than the lowest sophisticated student.

Two other measurements involved participating students in the ranking and sorting of 48 card-sized reproductions of paintings. The 'Preferential Ranking Task' required students to place the reproductions in any of seven categories from 'very appealing' to 'very unappealing.' Students also indicated most preferred and least preferred of the total set and wrote descriptions of each. The 'Classification Sorting Tasks' required students to sort the reproductions according to 'commonalities' and to provide 'captions' describing the basis for each category. The number of categories used by each student and the verbal content of the captions provided data on category discrimination and cognitive style. This device is quite interesting and appropriate for the study.

In addition to the descriptive inquiry, the study included a teaching experiment involving the same 24 students divided into three groups with four S and four N students in each group. Treatments consisted of a two-hour teaching session for each group emphasizing 'extrinsic,' 'intrinsic,' and 'subjective' approaches to viewing art, respectively.

Students' responses on the 'Preferential Ranking Task' were analyzed according to 'six subsets of the painting cards, forming descriptive categories of the compositions' resulting in thirty dependent variables. The categories were compiled by means of combined ratings by six judges according to abstraction, compositional movement, etc. There was no indication that inter-judge agreement (or lack of it) was considered or

determined. There was no listing of criteria for the judging of degree of abstraction, configural density, internal movement, etc. No justification was given for the selection of these categories; no indication was given regarding the relevance of the categories to the central problem of the study. This experiment added little to the study, partially because the two hour treatment was not sufficient to produce measurable results.

Results and discussion. Detailed analyses of differences between S and N students on measures of experiential background, category discrimination, response strength, and three indices of cognitive style are presented from the descriptive portion of the study. Analysis indicated that 'the greatest difference between the S and N groups in their preferences for painting compositions was in the area of abstraction,' with the S students, of course, ranking abstract works higher than N students.

Generalizations were made without reference to supporting data: N's preferred clearly delineated, familiar themes.. whereas S's disliked familiar themes....' (p. 49) 'All students tended to increase their interest in abstract works and to reject more realistic works in the second sortings.' (p. 50)

Discussion of results from preference measures covers sixteen pages with thirteen tables and three figures. Through this section little effort is made to assist the reader to attach meaning to the parade of figures.

Discussion of findings on cognition is better, but interpretations are presented that are not verified by the data: 'Categorized captions from the S's contained more associative terms than interpretive ones.' (p. 61) Even if the associative mean, 2.58, were statistically significantly different from the interpretive mean, 2.25, it is doubtful that a mean difference of .33 uses of a term justifies the stated conclusion. Results from the descriptive study generally indicate superior performance by sophisticated students on both preferential and cognitive measures. Differences in cognitive style and category width between S and N students are especially interesting. Chapter V, 'Interpretation of Results,' provides the clear, concise analysis of results lacking in the lengthy presentation of the data. Results from each aspect of the study are briefly reviewed and related again to the important issues mentioned in Chapter I. A few unwarranted conclusions are stated (p. 80), but mostly this chapter is readable and cogent.

Reviewer's commentary. This study makes several worthwhile contributions to the field. First an interesting topic is addressed and discussed in relation to some of the relevant literature. The attempt to gain further insight into the cognitive dimensions of art learning is an important enterprise, especially as related to the position of art education within general education.

Second, a research format involving multiple dimensions of art learning is explored in the study, allowing for inquiry into relationships among cognitive, preferential, and experiential variables. Possibilities for further imaginative and sophisticated research within this format are suggested by the breadth of inquiry and analysis exhibited in the study.

The study also contributes with respect to methodology, especially in the utilization of a sorting task which provides insight into cognitive styles. As a very natural kind of task, which is probably intrinsically interesting, the 'Classification Sorting Task,' promises to be a useful technique for inquiry into art learning styles.

The descriptive and experimental data that were collected, analyzed, and interpreted in the study provided less value than the aspects mentioned above. The research questions were narrower than the expressed intent of the investigation. The gulf between detailed information and meaningful interpretation and implication was seldom adequately bridged. Questionable sampling technique, lack of instrument validation, and insufficient treatment time and strength are examples of methodology problems that cause the reader to be cautious when reading the results.

There were tendencies to over-use statistics, over-report details of the results, and to state conclusions not supported by the data. One wonders why the weak experimental portion was conducted and included in an already complex and potentially complete study.

As with most dissertations, which often must account for diverse expectations from committee members, this one has its strengths and its weaknesses. Unlike many, however, the study reviewed here offers considerable value and demonstrates the effects of a competent inquiring mind.

REVIEWER

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THE DEVELOPMENT OF THE CONCEPT OF SPACE AS OBSERVED IN CHILDREN'S DRAWINGS: A CROSS-NATIONAL/ CROSS-CULTURAL STUDY

Betsy Nan Hess-Behrens
University of California, 1973

ABSTRACT

This study attempts to reinforce developmental theory concerning spatial comprehension by building upon the qualitative observations of art educators of the past, and by strengthening the empirical basis of contemporary investigations into the relationship between pictorial representations, intellectual maturity, and environmental stimulation.

Drawings from a wide variety of cultures were studied to determine whether the sequence and rate at which developmental characteristics appear are similar, or reflect unequal socio-economic/educational opportunities and ethnic diversity within societies; also whether differences between societies may correlate with modernity, prevalence of literacy, and severity of social stratification.

Drawings (following standardized instructions) were collected from middle and lower class boys and girls in nine countries--100 from each of grades 1, 3, 5, and 7 per group--approximately 800 per country (plus extra groups), for a total of 9,000 drawings.

Sorting categories were based on Piaget's description of stages in the development of the concept of space and the growth of logical thought.

Results suggest that these drawing stages follow an invariant sequence. Mean ages--higher than expected--lie within a large range at each stage; the mode appears at the onset of concrete operations; and differences, when appearing, generally lie in the direction of higher scores for advantaged groups.

REVIEW

Bette Acuff
Columbia University

Statement of the problem. This very ambitious study uses the stages of logical thought and spatial representation described by Piaget as the theoretical context for exploring the relationship between cognitive development, environmental influences, and graphic representation (represented here by children's drawings). Some of the major assertions presented in the first chapter follow:

1. 'Intelligence...is essentially a system of living and acting operations ....'(1), and it develops in a reciprocal relationship with the semiotic function. (p. 3)

2. It appears that there is a continuous, close developmental relationship between the pictorial and verbal capacities throughout childhood and up to early adolescence although, according to Piaget, language lags somewhat because of its greater abstraction from the concrete reality of the child's experiencing. (p. 5)

3. Drawing activity can function in concept formation and assist the acquisition of language skills. (pp. 5, 6)

4. Piaget views the child's system of signifiers-constructed by the child -- as a means of self-expression which are under the child's control. Thus, drawing is viewed as 'assimilative,' but it is also a form of 'imitative accommodation.' Drawing as a symbol-making activity of the child is a form of adaptive behavior, and thus is involved in the growth of intelligence. (p. 6)

Unfortunately, the terms 'assimilative' and 'imitative accommodation' are not adequately defined, and the reader who is not intimately familiar with the work of Piaget is left to wonder exactly what is meant by these terms in the context of the study. Definitions of these two terms in a footnote at the bottom of the page would have helped to clarify their specific application to the study.

The author presents the concept of space as the basic problem to be researched, stating:

> *The argument thus far has been an attempt to show that the concept of space involves development of the concept of objects, their classification and internal/external relationships. This transformation of three-dimensional reality into manageable two dimensional form is dependent upon the ability to create and store representations which serve as internalized mental images available for recall, reconstruction, and recombination.*
>
> *These representations in the form of visual images are not only useful in the development of language skills, but are somewhat prior to them and partake of a similar or parallel developmental structure.*
>
> *Because of the adaptive function served by visual images -- here of interest in drawing representations -- it can be inferred that they are involved with the actual development of intelligent thought itself. The power of the symbol (internal visual image as distinct from language signs) is attested to in the imaginative creative acts of scientists and artists alike.*
>
> *If then, the development of these visual images -- which are so inextricably bound up with the development of spatial concepts, of creative, logical thought -- can be examined through the study of drawing representations, we can learn something about the problems with which the child is struggling and those upon which he can build because of their successful solution. (p. 9)*

Related research. Related research is presented with respect to two general assumptions: (1) the development of the concept of space is basic to the development of representative thought and to the growth of logical thought in general; and (2), a particular culture or social context affects the realization of possibilities for cognitive growth that exists as potential in the nervous system of the maturing child.

With respect to the first assumption, Hess-Behrens surveys a number of studies dating from 1885, dealing with the developmental aspects of children's drawings – especially as they relate to the study of the age-related development of the relationship between objects as reflected in graphic depictions. The work of Harris with the Draw-a-Man test, as well as his comprehensive survey of children's drawings as measures of intellectual maturity, is advanced as support for the contention that the child draws what he knows, and that this knowing grows as the process of concept formation develops along the lines of differentiation, analysis, abstraction, and reconstruction.(2) Piaget's assertion that the stages of children's drawings follow an invariant sequence for all children everywhere and that they are likely to occur at the same general age level under normal circumstances is to be examined through studying drawings from nine countries to determine whether this development is invariant or affected by differing cultural experiences.

With respect to the second assumption, the author devotes considerable space to a survey of literature that demonstrates the effects of social class and cultural differences on the ability to discriminate geometric patterns, on conservation tasks, on various tasks requiring spatial ability, on tasks requiring deductive reasoning, and the ability to depict objects graphically. Special emphasis is given to research done among traditional societies in Africa which indicates that children from such societies have difficulty with picture perception (apparently a learned ability fostered in Western cultures) and with Piagetian tasks requiring visualization and retention or manipulation of mental images. A number of other studies are reviewed which indicate that the following cultural and social-class related factors affect the development of artistic productions:

a. Motivation to achieve is greater in a complex society where survival is more challenging; therefore the possibility of intellectual growth is greater in a complex society.(3)

b. In some societies, high Need-Achievement affects the treatment of space so that high N-Achievers use more diagonals and other design elements than do low N-Achievers.(4)

c. Freedom of movement and tactile exploration lead to a better ability in spatial representation.(5)

d. The presence of a significant adult to help the child elaborate and to mediate between differentiated sensory impressions and the concept-forming processes of his mind at the crucial time of transition between the sensori-motor and pre-operational periods affects the child's ability to depict his experience graphically.(6)

Parallels are drawn between the African child and the Black urban ghetto child with respect to lack of opportunity to explore and manipulate the environment. From this varied and interesting survey of the literature relating to social and cultural differences, Hess-Behrens suggests that '...adaptation -- interaction of man with his environment -- has in both its physical and social aspects emphasized the accommodative rather than the assimilative in some traditional societies and in some disadvantaged segments of modern ones. However, what is functional and of positive value in the former often becomes dysfunctional in the latter.' (p. 32)

The remainder of the chapter is devoted to a discussion of Piaget's contention that the drawings of children in the early stages are largely assimilative in character, but that drawings become more accommodative as the child becomes less ego-centric and more aware of the visual appearance of his environment.

> *Thus, drawing serves an important intermediary function in the development of mental images by correcting and transforming the data from visual perceptions according to the conceptual framework within which the child performs these activities. (p. 37)*

The rationale for the Hess-Behrens study rests on this point: that, since 'the child's images are fragmentary and contain incongruities which become more and more disturbing and demanding of correction as he grows older, examination of drawings done from memory of an object or a situation can, by the same token, give a remarkable amount of information about the child's level of cognitive functioning in general.' (p. 37)

Research objectives and methodology. At the end of Chapter One, assumptions and hypotheses are clearly stated.

It is assumed that:

1. *Examination of the concept of space in children's spontaneous drawings can give information about their level of cognitive functioning.*

2. *Children's spontaneous drawings can be used as a reasonably culture-fair testing instrument.*

It is hypothesized that:

1. *Similar developmental characteristics will appear in drawings made by children in all social classes and societies.*

2. *These characteristics will appear in the same sequence in all groups.*

3. *The level attained and rate of development will vary according to socio-economic and educational opportunities within groups.*

4. *The degree of modernity in a society and prevalence of literacy will affect the rate of development and level attained.*

5. *There will be a correlation between reading and drawing scores.*

6. *The extent of contrast in drawing performance between social classes will be greater in more sharply stratified societies than in those with a more homogeneous structure. (p. 39)*

Chapter Two describes sampling and testing procedures, sorting criteria for drawings, and drawing classification criteria according to Piaget's stages of cognitive development.

Drawings, 9,350, were collected from children in fifty-six schools in Brazil, Denmark, Greenland, Hong Kong, India, Italy, Japan, and the United States. Since one goal of the study was to determine the effects

of social class within each culture on the drawings of children, the author attempted to stratify the samples from each country in terms of socio-economic-status (SES). Given the distances and the number of intermediary personnel involved in collecting data, and the fact that SES indices developed in one country are not necessarily valid for application to the social structure of another country, the selection problems for this large number of drawings were enormous. Such limitations in classifying children according to SES indices are carefully discussed by the author (both in the section on sampling and in the section on study results). It is evident that she is aware of the affect of such variability on results obtained. In each country drawings were collected from middle class and lower class students in the first, third, fifth, and seventh year of schooling.

Each of the samples from each country is briefly described, in terms of the SES represented by each school; the type and amount of art training offered for each school, and whether or not reading scores for the samples were obtained. It is obvious that the author is aware of the fact that the great diversity of factors which impinge on the children of different cultures makes the classification of data in the samples extremely difficult. In spite of an obvious desire to make comparisons between the drawings of urban Black Americans and African children, there were no African children included in the sample (despite four different attempts to collect data, arrangements for testing fell through). Particular cities selected can not be considered as being representative of certain countries. Communication difficulties in Denmark caused the Copenhagen sample to be composed of children of very high professional class and very low unskilled laboring class parents, rather than middle and lower class, as elsewhere.

Tables of descriptive statistics offering comparative data for each country are presented. The educational and economic indicators considered are literacy, literacy increase, school enrollment ratios, educational expenditure, gross national product, urbanization (percent of population living in cities of 100,000 or more), and scientific capacity (contribution to world scientific authorship, and contribution to scientific journals).

Among the mass of information recorded in this section, it would have been helpful for the reader if the author had related her descriptions of sample characteristics to specific hypotheses (for example, hypotheses three, four and five). Since so much information is presented, perhaps a visual

presentation of approximate ratings or classifications of each sample according to homogeneous vs. highly stratified social class structures, literacy rate, etc. would have made it easier for the reader to keep in mind the variables important to the comparative nature of the study.

Test administration. Children were provided with sets of six crayons and a sheet of 12 x 18 inch white drawing paper and asked by their regular classroom teacher to draw a picture of themselves at play with friends near their home or school. Actual testing time varied from thirty to forty-five minutes. Information recorded on each drawing included date, sex, age, grade, school, country, teachers name, ethnicity, and reading score (where available).

Judging procedure. A research assistant was trained over a two month period, using drawings from two pilot studies, and two large wall charts. The first chart offered Piagetian stages with respect to the development of certain concepts: growth of logical thought, classification; early number and pre-number experiences; topological to Euclidean geometry; projective geometry; structuring space in terms of vertical and horizontal axes; and measurement. Points of conservation were underlined and general developmental changes were noted. The second chart presented a large number of simplified drawings, arranged in stages to correspond to the Piaget chart; thus presenting examples of the kinds of pictures which would exhibit drawing characteristics basic to the criteria used in designating each category. The principal investigator and a research assistant classified each of the drawings, coding them according to the classification system which is listed below. Disagreements were resolved by joint discussion. A third person, an art educator, was also consulted, at which time a spot-check and discussion of the application of criteria took place.

Again, one wishes that an example of a section of either chart had been presented , so that a more specific idea of the correspondence between achievement of cognitive operations with respect to order, number, etc., and the graphic representations indicating these operations could be made apparent.

The next 45 pages of the second chapter are devoted to a discussion of the sorting criteria used in the study, and a lengthy discussion of the criteria applied to classify drawings into the seven stages of the classification system.

With respect to sorting criteria, the author makes it clear that the attempt is to examine categories based on the intellectual problems with which the child is groping in terms of the growth of logical thought and spatial concepts, rather than in terms of drawing style criteria. With regard to grappling with intellectual problems, the author is well aware that the time limitations imposed upon the making of the drawings causes difficulties, i.e., is a particular drawing left unfinished because of lack of time, or because the cognitive problems were insurmountable, or because the child did not have enough expressive images at his disposal? (This question is one which will plague investigators of children's artistic development for some time to come; we simply do not know enough about all the factors which enter into the complex process of making art, nor do we have sophisticated enough methods of assessing the relationships of all the variables that might be involved.) All drawings were placed in the most correct, yet highest category which could reasonably be inferred from the information available. Final coding of drawings difficult to classify depended upon agreement reached through meticulous joint examination and discussion.

The classification system. Stage determination was made on the basis of the handling of topological relationships (order, enclosure, continuity), use of Euclidian forms, development of a consistent perspective reference frame, degree of visual realism, and individuality suggesting symbols rather than signs. (Neither of the latter terms are defined.) Using Piaget's three periods, a) Preoperational, b) Concrete Operational and c) Formal Operational as the organizing categories, the classification system developed is as follows:

Pre-Operational Period:

Stage I: Pre-Conceptual (ages 2-4)	(coded 1)
Stage II: (ages 4 to 5 or 6)	(coded 2)
Stage III: (ages 5 or 6 to 7) Drawing styles A, B, and C	(coded 3)

Concrete Operations:

Stage IV: (lower level: up to age 8)	(coded 41)
Stage IV: (upper level: ages 8 to 9)	(coded 43)
Stage V: (ages 9 to 10 or so)	(coded 5)
Stage VI: (ages 10 to 11)	(coded 6)

Formal Operations:

Stage VII: (ages 10 1/2 or 11 and on)	(coded 7)

Each of these stages is discussed in some detail, with reference to the child's ability to deal with order, enclosure, and continuity, and the ability to conserve number, volume, and distance. Examples of the manner in which each of these aspects of cognitive functioning may be represented in the spatial deployment of objects in areas in drawings are given. Three drawing styles identified for stage three are briefly described. Style A: in which the paper is divided into sky and ground areas (although these are discontinuous); the basic horizontal/vertical structuring is somewhat implicit, and fold-in or fold-out phenomena are not often present. Horizontal surfaces on objects and ground areas are drawn in plan form. Style B: The paper edge is considered as the spatial boundaries, with all the enclosed areas representing ground. Some central point becomes the important spatial referent with all distances and relationships directed toward it from the edges. Fold over is most evident in this style. Style C: Spatial relationships are suggested along the bottom of the paper or upon a simple, undeveloped base line.

Anyone who has attempted to classify children's drawings knows that there exists such a variety of attributes to note in accomplishing classification that one can appreciate the author's reluctance to rely on a simple list of attributes for classification. However, one wishes heartily for some summary statement or listing of common attributes of drawings for each stage, or perhaps some visual exemplars which might be useful in organizing the mass of information presented in her discussion. One also wishes for a more specific, detailed discussion of the identified stages and their relationship to the development of visual images. The importance of visual images to graphic representation is suggested in the initial pages of the dissertation (see previous quote from p. 9), but this thread is not picked up again at a later point, after characteristics of stages have been described.

Results and discussion. Analysis of data was conducted using the following variables: Sex, Age, Class (Lower, Middle), Art, Score, (Stage I, II, III, etc.), Drawing Style (A, B, C), and Reading Ability. Information on reading ability was available for six populations only.

Results of data analyses are graphed, and these graphs are grouped according to country and city. Over eighty graphs are presented in the analysis of data

section: the volume of material presented is rather overwhelming. The ordering of graphs by country seems logical, but it makes comparison between countries difficult, necessitating much flipping back and forth between pages to compare performance in relation to the same variables. Since the study is concerned with cross-cultural comparisons (as well as with the possibility that stages develop in invariant sequences, regardless of cultural effects) the possibility of making visual comparisons of graphed data to note differences and similarities would seem advantageous.

Examination of relationships between variables was made as follows: (1) Age vs. Art Score: For each country the average age vs. art score was obtained; standard deviations for each art score level computed; and the range of ages for each level obtained. According to the author, for all populations the majority of observations lie in the range Art Score 2-5, and for this range the 'average age is approximately a function of the Art Score.' (p. 110) (Comparison of graphs and detailed descriptions of analysis by country confirms this.) Exceptions occur in some populations around scores 5, 6, or 7.

(2) Class Differences: These were examined using the Mann-Whitney form of the Wilcoxen test. Scores for Lower vs. Middle class children for each art score level were compared, using the Wilcoxen test. The Hodges-Lehman Delta was also used, an estimator of the shift to the right in the distribution of the art scores for the middle class group. Hypothesis three assumes such a shift to the right in art scores of middle class children; thus the Hodges-Lehman estimator is an appropriate descriptive statistic to use in testing the hypothesis. Indeed, shifts did occur for samples from Brazil, Hong Kong, India, Italy, Japan, and some cities in the United States. Shifts were not consistent at the same age level for all samples, however.

(3) Comparison of Lower and Middle Class Age: Distributions at Each Art Score: These comparisons were made to further examine data related to hypothesis three. For each particular art score, style, and sex, distributions of ages for the lower and middle class were examined. A Wilcoxen Test was applied to the distributions to test whether the distribution of middle class ages was shifted to the left. The discussion of findings is incomplete in this section, although later the author states that 'where social class differences appeared, significance was usually found in the direction of higher middle class scores, with one small exception in Brazil.' (p. 116)

(4) A/B Style Comparisons: These comparisons were carried out with respect to relationships of sex, age, and social class to use of the two drawing styles. Comparisons were done for scores 41, 43, and 5, since these were where differences were expected to be greatest. The Wilcoxen test was applied to make comparisons between the age distributions of A style children at a particular art score with that of B style children. Age distributions for these two styles were also compared for boys and girls. Chi-square tests of independence were used to answer the questions of whether the tendency to draw A type or B type drawings is connected with sex (or class).

With respect to drawings style vs. sex, the following significant relationships were found for the lower level of stage 4 (41): India and Italy - Males more B's than A's; Females more A's than B's. Brazil-males more B's than A's, females more B's than A's (but proportion of B's to A's significantly higher for males). In the upper level of stage 4 (43): Denmark - both sexes, more A's than B's, but the proportion of A's to B's for males was significantly higher.

With respect to drawing style vs. social class, the following significant relationships were found for level 41: Brazil - middle class had a higher proportion of B's than A's; India - middle class more A's than B's, lower class more B's than A's. For level 5: Italy - middle class had a higher proportion of A's to B's than the lower class. For level 43: Hong Kong - lower class had more B's than A's, middle class more A's than B's.

The author does not mention why style C comparisons were not made. It would seem appropriate to state why style C was not included in the analysis, since the style was described in the previous section as the third drawing approach used by children. In the discussion of results (see below) she states that all three drawing styles appeared in every population. (One wonders if most style C drawings have disappeared by the time Stage IV is reached, since it appears to be the less sophisticated of the three styles, however, the author does not enlighten us.)

(5) Reading Score Comparisons: Reading score comparisons were made, using Jonckheere's test for ordered alternatives, an appropriate test to answer the question, 'Do the best readers have the highest art scores, the medium readers the next highest, and the poorest readers the lowest art

scores?' A modification of the test was made to take into account the fact that shifts to the right of each distribution for each reading level may not be equally spaced.

Reading score comparisons of two types were made: by examining art scores for each sex and grade; by examining the age distribution for each sex and art score. The analyses used appear appropriate for testing the research hypotheses.

With respect to the initial hypotheses, then, the following results were obtained:

1. *Similar developmental characteristics were observed in all societies except in the Amazon population. All three styles -- A, B, and C -- appeared in every population, including the Amazon Indians.*

2. *In every population average age is an increasing function of art score.*

3. *Where social class differences appeared, significance was usually found in the direction of higher middle class scores, with one small exception in Brazil.*

4. *Of the populations examined there was only one non-literate society (Amazon) and one low-literacy society (India). Only two in the Amazon sample reached Stage 41, none going beyond. These, and the largest number of Stage 3 drawings (ten times either of the other two groups) appeared in the most developed group. Drawings in India were taken from one of its most modernized cities, Bombay; hence not representative of the areas where literacy is especially low. Nonetheless, there were a larger number of children drawing at the lower levels and ages were generally shifted to the right.*

5. *Reading scores were available for only six populations. In three of these, there was a significant correlation for at least three grades. In one there was a significance for*

two grades. In one there was significance only at one grade. And in one country there was no significance (however, the absence of data for first and third grade medium level readers there prevented use of the statistical tests especially designed to examine these data). (p. 116)

6. *Greater social class differences between middle and lower groups were generally observed in more sharply stratified societies. Difference was observed between the very high and the very low groups in Denmark, a relatively homogeneous society, where the middle class was not tested. (p. 117)*

A detailed and thorough discussion relating statistical findings (for each population) to specific research questions follows.

Conclusions. Several of the conclusions of this study are of special interest. First, as reflected in the drawings used in this study, the mean age of entering concrete operations is higher than that suggested by Piaget. Second, the range is very large at every stage, and third, a very large proportion of all children are found at the 41 drawing level. The problems of representing a horizontal/vertical reference system, the coordination of points of view, and three-dimensional rendering within a plane are not solved by most of the children in this study. Finally, of interest is the slight dip in age which occurs uniformly at Stage Six and occasionally at Stage Five or Seven. Apparently this dip represents the culmination of untutored drawing development, and lends support to the contention of many art educators that the older child declines in art ability and interest at the time when social emphasis is placed upon verbal skills, and the child becomes frustrated with inability to solve the problems of visual realism.

This last point is of special interest to art educators: Can we indeed counteract the social and psychological forces that tend to arrest artistic development and the representation of spatial relationships by providing appropriate art education?

Reviewer's comments. Those interested in the artistic development of children will find this study a source of a great deal of worthwhile information. The discussion of visual representations in traditional societies and disadvantaged groups is well written and of special interest.

The description of classification criteria for sorting children's drawings (pp. 72-107) will be of special interest to college students and researchers who are interested in the child's art expression as an indicator of cognitive development. It does, indeed, represent a rich extension of Piaget's developmental theory. The author states that modified versions of the two charts used in sorting drawings are soon to be released. Hopefully these charts will help organize the large amount of verbal information presented in this section so as to be more readily retained and applied by users of the information.

The difficulties presented by the organization of the graphed data have already been discussed. If the material in this study is presented in book form at some future date, it is hoped that a reorganization of the graphs will be made so that visual comparisons are made easier for the reader.

This study is a real contribution to the literature on children's graphic representation. I hope the author continues to do further research (as she suggests in her concluding discussion) by comparing the three drawing styles identified here with those described in theories of visual/haptic or field dependent/independent personality types. The implications of this study for more detailed and controlled longitudinal studies to be carried out in rural and urban areas are also of interest.

FOOTNOTES

(1) J. Piaget, *Psychology of Intelligence,* (New York: Littlefield, Adams, 1968), p. 7.

(2) D.B. Harris, *Children's Drawings as Measures of Intellectual Maturity,* (New York: Harcourt Brace and World, 1963).

(3) J. Piaget, *The Child's Conception of the World,* (London: Routledge and Kegan Paul, 1967), p. 5.

(4) E. Aronson, The need for achievement as measured by graphic expression. in J.W. Atkinson (Ed.), *Motives in Fantasy, Action and Society,* (Princeton: D. Van Nostrand, 1958), pp. 249-265.

(5) J. Tanner and B. Inhelder, (Eds.), *Discussions on Child Development,* (New York: International Universities Press, 1958).

(6) I. Sigel, Language of the disadvantaged: the distancing hypothesis. in C. Lavtelli (Ed.), *Language Training in Early Childhood Education,* (University of Illinois Press, 1971), p. 6076.

REVIEWER

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THE RESPONSE SET IN ART LEARNING

Larry Murray Friedenson, Ed.D.
Indiana University, 1973

ABSTRACT

The problem centered on combining three methods of perceptual training to improve aesthetic quality, drawing accuracy and the use of space in the art product.

Related Literature and Theoretical Statement

Humans always display in behavior some predisposing tendency that in part predetermines responses made to stimulus. Several investigators have proven this is especially true in learning areas as basic as instructions and problem solving. Subjects tend to form sets that influence responses. Furthermore, the sets act as agents to facilitate the learning of other sets. These newly formed sets guide action or thought and function as hypotheses; they reduce to a considerable degree 'surprise' and simplify cognitive work. In the utilization of response sets as hypotheses four principles are involved. They are concerned with frequency of past confirmations, number of alternatives available, motivation and cognitive conceptual structure for the hypotheses. Three separate studies (Salome, Rennels, Kensler) in art education illustrate the concept of the response set for hypothesis formation in the visual arts. The unification of these studies could produce a significant change.

Hypotheses

Based on this idea three research hypotheses were proposed (a shortened version appears here):

> *In an art program that combines several response sets for handling visual information, college non-art majors will improve significantly in terms of (1) aesthetic quality, (2) spatial quality, and (3) drawing accuracy.*

Procedures

Sampling: The subjects (thirty) of the control and experimental group were college students not majoring in art. They were enrolled in an elementary art methods course.

Collection of Data: *The experimental group was given five lectures; assignments followed on contour lines, space cues, analytic and synthetic perception of events in the environment. All of the lectures and drawings emphasized the continuous interaction and relationship of one response set to another. The control group did media and ready-made type art projects. Products were collected and judged.*
Instrumentation and Judging: *Judging was completed by art education majors trained to use the Rouse and Salome Scales. The scales consisted of phrases that allowed discrimination between such items as variation in Line, Texture, Flatness/depth. Each item was on a graduated five point scale.*

Analysis of Data and Results

Five measures were obtained. These measures included: Overall aesthetic quality (Hypothesis one), Depth (Hypothesis two), and (Hypothesis three) Proportion, Communicative symbol, Closure clarity. On all measures the experimental group registered substantial improvement beyond the .01 level of significance. Therefore all hypotheses seem to be proven.

Discussion

This study suggest that ready-made techniques of the control group should not be taught to elementary education majors. Also, the continual use of these methods may cause a loss of sensibility to real visual art experiences. A program of response set training can be beneficial to art learning.

Recommendations

The following recommendations derived from this investigation:
1. More work could be encouraged to unify other distinct studies for further generalizations.
2. Further research is needed to discover other main response sets in art.
3. Information on sets at specific developmental ages could aid art educators.
4. Response sets could be used to teach art history and studio.

REVIEW

Rex E. Dorethy
Ball State University

Statement of the problem. This dissertation opens with a loosely constructed and terse introductory paragraph replete with a fragmented sentence in which the author pleas for assistance and direction in art teaching through unified art research. The study appears to be based on the claim that art education research is extremely diversified in direction, and that while single perceptual treatment methods may or may not improve art performances, no effort has been made to combine several related treatment methods or to assess their total effect (p. 1). Determining the problem under investigation requires the reader to analyze the question, 'Would emphasis upon three specific methods of perceptual training that concentrate upon several response sets in drawing improve the aesthetic quality, drawing accuracy and space of the product?' (p. 2)

While research problems are properly stated as questions, clear definition of terminology, constructs and variables is desirable early in the problem statement section. The author does not oblige the reader in this regard, nor does he provide sufficient information in the definitions section, preferring instead to utilize only terms defined by previous research relative to the study. While response set is described, one is left to wonder what might be meant by 'aesthetic quality, drawing accuracy and space of the product.' Research considerations aside, this distinction seems important since, while art educators may be able to extrapolate meaning from the statement, the dissertation is catalogued by University Microfilms under a *Special Education* heading, and not apparently, under an art education context. Special education or exceptional children, incidently, are not mentioned as considerations in the objectives section of the study.

The author also fails to clearly state the purpose of the study, launching instead into a disordered discussion of the problem's significance by: (1) citing the large amount of 'unfocused research' in our field (p. 3); (2) proposing that combined studies might serve as a curriculum basis for both elementary children and college non-art majors, since their problems are similar (p. 2), and (3) citing the need for learning perspective. Upon scrutiny, the reader may choose among several purposes scattered

throughout the study. The researcher suggests: (1) 'this study attempts to organize three distinct investigations into a whole; a needed step toward combining findings for greater utilization power' (p. 3); that (2) '...research is needed to answer another question that arises: could the response set be a series of actions necessary for the concrete operations that Piaget describes?' (p. 15); and then (3) '...combine these studies to determine if, in fact, they are all related by the response sets' (p. 21); and eventually isolates, (4) '...improving the art capabilities of elementary education majors,' as the purpose of the study (p. 89). No footnote or reference is cited for the above comment concerning Piaget.

Related literature. In a rambling 17 page description of the theoretical basis for the study, the author points out that 'set is ubiquitous to all forms of behavior' (p. 4), and reveals sources which claim the underlying meaning of response set to be indefinite, the terminology chaotic, and indicate that at least 34 terms and phrases are used in the literature as variants of the set concept (pp. 4-5). Unfortunately, the statement is left standing and no attempt is made to delineate sources of disagreement. The researcher utilized 23 sources in his development of a theoretical basis and supportive literature, with fully 60 percent of these dating prior to 1960, and many being published in the 1930-40 era. Conversely, Haber recently listed 30 studies dated later than 1960 which dealt specifically with response set, many of which both support and cast doubt on some of the basic concepts utilized in this research (Haber, 1968, pp. 703-718).

Short paragraphs are devoted to discussing the basis of response set, sets as instruction, set in problem solving, flexibility of set, and set transfer for hypothesis formation, in both the theoretical statement and related literature sections. Establishing a link between the reviewed literature and the theoretical basis for the study is difficult, since no attempt is made to divide the discussion into categories, to use sub-topics, or to summarize specific portions. A general summary, however, appears at the end of the related literature and in the middle of the theoretical statement. Eventually, Allport's principles of frequency, number and support for set responses are arrived at, and thereafter appear to form the basis for structuring portions of the methodology, and for analyzing some related studies. Most of the related literature is repeated in Chapter 1, Chapter 2 and in Chapter 5.

Set is used both as a general and specific term, and the reader is left with the impression that nearly all behaviors occurring in learning situations are,

in fact, response sets. Identification of how these sets will be useful to the study is difficult, however. The lack of a cohesive presentation makes analysis of the set constructs reviewed also difficult. For example, while attempting to utilize existing set theory as a means of structuring the treatment background, the author confuses the issue by juxtaposing theoretical discussions from both Bruner and Allport (pp. 8-9) in succeeding paragraphs, without referring to Allport by name or clarifying pronoun referents.

Similarly, a tendency to mention a psychological study dealing with set, then to explain its meaning in terms of art learning tends to destroy the main point of the discussion (p. 8). This habit seems to be an artifact of the author's concern for proving that response sets can aid in art learning (p. 16). The researcher displays a disturbing tendency to subjectively 'glance' at a study by Eisner (p. 11), find a 'startling point' (p. 15), and then 'prove' (p. 16) that response set can aid in art learning (p. 16). One wonders if these findings will be as startling to other art educators.

If research directly related to the problem cannot be found, normal procedure dictates examination of studies close to the research in concept. The author finds it necessary to utilize data from only four art education studies, stating that no researcher has been able to develop a means by which students may learn to deal with perspective or space (p. 3). This comment seems odd in view of the fact that each of the three studies used extensively in the treatment dealt with some aspect of spatial organization, and at least one has the benefit of subsequent experimentation. Further, the 'Registry of Studies in Art Education,' lists more than 20 studies dealing both experimentally and descriptively with aspects of perception in art (Brouch, 1974). Many of these studies are to be found in University Microfilms, and some deal specifically with children's ability to render spatial organizations as affected by motion, stationary information, and other stimulus situations.

Research objectives. The problem statement chapter includes seven statements listed as objectives for the study. The first five of these objectives resemble things to do, more than goals to be accomplished. For example, Objective Five states, 'The pretest drawing *(sic)* of the experimental and control group will be compared to the post-test drawings (p. 24).' Statements such as these seem more related to the means by which the study will be accomplished than to its ends or objectives.

Objective Six, however, states that the study will attempt to determine if a '...system of unified response sets and alternated teaching procedure (analytic or synthetic) will produce a significant change in aesthetic quality, spatial depth and drawing accuracy.' This statement seems an attainable goal if one accepts the validity of the instruments used, the adequacy of the proposed design and that a comparison will be made to some unmentioned group. Objective seven states in effect, that an attempt will be made to '...summarize an approach to teaching that combines the response sets listed by the three researchers cited' (p. 24). This goal also seems to be attainable from a descriptive standpoint, given concise reporting and delineation of the response sets used. Both goals may be subject to design limitations of the study, however.

Statements of purpose scattered throughout the chapters refer to improving art performances, combining studies for greater power, and determining if the treatments are related. The criterion of relationship poses a new problem of design and analysis for the experiment. Experiments which have as their main purpose 'improving the art capabilities of elementary education majors' (p. 89), may not be adequate for the analysis of variable relationships. Relationship designs tend to contrast and compare, something quite different from testing overall effect.

In combined form, the three hypotheses for the study state that: Art programs combining several response sets for handling visual information will improve: (1) aesthetic quality, (2) spatial quality, and (3) drawing accuracy (p. 22). Although the erratic direction of the statements concerning purpose and significance indicate that only a general and diffuse notion of the problem may be at hand, the hypotheses seem to correspond closely to the original problem statement. The author renders these conceptual statements adequately, but does not define the dependent variable terms. One may infer from the problem discussion or the terms section that the dependent variable measures operate adequately in this regard, but exactly what is being measured is not clear, particularly in terms of 'aesthetic quality.' Also, the above statement regarding analysis of related response sets implies the need for hypothesis statements referring to 'relationship,' since correlation coefficients will be in order. The hypotheses and objectives do not appear to consider all the variables present in this study, particularly those dealing with interaction effects.

Methodology. This is a traditional two-group experimental study. The author does not describe the 'random' method of assigning subjects (Ss) to groups, but claims that the experimental treatment was assigned to an intact group of 16 Ss randomly selected from three class groups, and the 14 control group Ss were then selected from the two remaining sections (p. 45). Impartial random selection would imply that Ss for each class group might have equal chance of being assigned to either of the study groups. This unclear method of assignment to groups is suspect, as is the method of treatment assignment. Further, the two group sampling procedure does not seem to take into consideration the design variables suggested by the problem statement and objectives, perhaps a residual of failure to clarify the direction of the study.

The researcher describes his design as a 2 x 2 factorial with pre- and post-test measures on the experimental and control groups (p. 54). Factorial analysis of variance is the statistical method that analyzes the independent and interactive effects of two or more independent variables on a dependent variable. The author's commentary indicates concern with three dependent variables and three independent variables. This would imply more interactive effects, more cells for analysis and hence more groups and Ss would be needed. An important characteristic of factorial analysis is that several hypotheses can be tested simultaneously. Not all of the possible hypothetical situations are recognized or controlled in this study.

Additionally, the author asserts: (1) that set is a mediating influence operating somewhere between stimulus and response when considering the responses involved in art learning (p. 5); (2) that many types of response sets may be involved in art learning (pp. 16-21); and (3) that combining several studies may generate still more powerful bodies of information (p. 3). If the research is to be clear, convincing, and contribute useful information to the field, a design is required which isolates and specifies precisely the response sets to be invoked, determines the effects of different response sets, and controls for combined variable effect. The mechanics of response set in art learning and the effect of those selected upon the sampling at hand (adults, not children as in the original studies), could stand useful explication prior to the research. Several studies might be necessary to control and delineate these considerations. Attention to these details would be necessary to offer conclusions as to which of the

invoked sets (or combined sets) provide causal effects and which yield inconclusive data. The research proposition set forth in this study does not seem an adequate means of reducing these limiting factors. Generating powerful data requires powerful design.

Questions may also be raised concerning the adequacy of the treatment for the experimental/control groups in this study. The research tended to contrast several response sets in drawing to normal classroom activities (pp. 46-49) and then measure the results by pre-tests and post-tests utilizing one item drawing tasks. The control Ss received no instruction in drawing and practiced a potpourri of art processes without drawing. These activities are of questionable value to the research purposes. The research simply compares (1) instruction in drawing against no instruction in drawing, (2) sequence and organization of spatial concepts against no spatial concepts, and (3) several hours of drawing practice against no drawing practice, and then tests for differences in drawing. Both groups were asked to draw 'a city street' (p. 47) as a pre-test and both were then asked to draw a choice of: (1) 'a river,' (2) 'a stream,' or (3) 'a roadway' as a post-test. The post-test, therefore, was not identical to the pre-test, nor is the validity of this arrangement described. The experimental group received practice in drawing 'occurances along a city block,' drawing a 'stream of river,' drawing objects in space, and received contour and perspective drawing information (pp. 46-49). The experimental group, it would appear, had practice with the post-test items during the treatment period. No similar practice was recorded for the control group.

No attempt is made to justify the judgmental procedures used to establish ratings of the drawings produced, although interjudge reliability is reported at .76 for the four raters. The basis and method for this figure is not reported.

The researcher stresses that the two main set concepts in this study are perspective and drawing accuracy, but the relationship of these variables to aesthetic quality is never established. No data concerning the Rouse or the Salome instrumentation is provided, beyond a statement of reliability range of .63 to .91 for the former. The brief description of the Rouse and Salome Scales are not accompanied by any type of validity data, type of reliability, or theoretical support. The Salome Scale is purported by the author to measure drawing accuracy, the Rouse Scale aesthetic quality. The Rouse Scale is described as discriminating among products that contain

'variation,' with high scores being assigned those with variability. This reviewer wonders if aestheticians would agree that 'aesthetic quality' is synonymous to 'variation.'

Additionally, the single item of the Rouse Scale used to identify spatial concerns provides only a 1 to 5 rating as to whether a drawing contains little or much appearance of depth/distance. The complexities of space, formal perspective, isometric perspective and monocular clues in picture making seem far too complex for valid ratings to occur on this simple scale.

Design weakness, inappropriate sampling procedures, lack of variable control, practice effects, and possible instrument limitations tend to severely limit the power of the study.

Results and discussion. Statistically significant differences were found for all directional hypotheses, when the experimental and control groups were compared for 'aesthetic quality,' 'drawing accuracy,' and 'spatial quality,' although the results may be questioned. Attention should also be brought to several accompanying errors.

The original problem's concern for 'space of the product' (p. 2), changed to 'space depth' (p. 1), became 'spatial quality' (p. 22), 'spatial depth' (p. 24), and is tabled as 'depth' (p. 59). Such changes in terminology make identification of salient points difficult for the reader. The researcher is also disdainful of using less than (<), greater than (>), symbols in most tabled data, and numerous .01 levels are listed without the required F-ratios being cited. The researcher finds significant differences in aesthetic quality, the 'sum of all the measures on the Rouse Scale' (p. 83). In separate analysis, a significant difference was also found to exist on the depth portion of this scale when group comparisons were made. Differences occurring on one portion of the instrument could very likely confound the statistical analysis of the entire instrument, rendering the findings suspect, since no treatment distinctions were designed. Similarly, where causality is concerned, there is no point at which one can be certain as to what is causing the differences. The researcher maintains, without basis, that the total effect of the treatment was responsible, yet Salome's treatment is known to be an effective means of affecting perceptual change and could be a contributing factor to differences occurring on the Rouse Scale as well as the Salome Scale,

for instance. The design and analysis of this study cannot distinguish such effects.

Only a short criticism is needed to analyze the author's data discussion. The researcher is prone to discover significance 'far beyond' the .01 level of confidence (p. 60) to 'prove' his hypotheses (p. 61), and then give 'unqualified acceptance' (p. 61) to the findings which lead to 'conclusions' (p. 61). For the skilled researchers in our field, no further commentary is necessary.

Reviewer's commentary. While the notion of combining and replicating established studies is an interesting one, it is difficult to subscribe to the many findings and recommendations found in this research, due to its inherent weaknesses. Both the problem and purpose in this study are ill-defined from the outset and need clarification if the generated data are to be a contribution. Many of the errors contained therein could have been avoided through pilot study development, in depth research by the author and guidance by his committee.

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REVIEWER

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THE VISUAL DIFFERENTIAL: AN EXPERIMENTAL STUDY OF THE RELATION OF VARIED EXPERIENCES WITH VISUALS TO SHAPE DISCRIMINATION

Mary GraceMenden Stieglitz, Ph.D.
The University of Wisconsin, 1972

ABSTRACT

The purpose of this dissertation was to experimentally investigate methods of developing progressive discrimination of aspects of art. Progressive discrimination can be described as the ability to observe beyond the literal ... to describe, analyze, and interpret. The experiment contrasted the relative value of three variations of a visuals approach, to a control studio approach, in developing shape discrimination. The objective of the visuals approach was to develop progressive discrimination of shape among groups of college non-art majors.

The basis for the three visual variations was a slide program developed by the experimenter. The slide sequences attempted to stimulate awareness of shape, especially the figure ground phenomena. The program was used: 1) in an unmodified manner and presented with the accompanying commentary; 2) modified by open verbal interaction of the students with the visuals and commentary; and 3) by the verbal interaction plus a photo media variable within another aspect of the treatments.

Over a two-week period, the four treatments were replicated simultaneously at each of two independent locations. Progressive discrimination was determined by the results of three measures: 1) a verbal response test using slides of noted paintings; 2) a pairing problem incorporating reproductions of well-known works; and 3) a manipulation problem involving a two-dimensional design. All groups were post-tested on all three measures. The results were computed for the four treatments involving the total study population as well as the separate locations. The results supported, in part, the premise that visual involvement is accompanied by progressive discrimination.

Of the three visual variations, two treatments differed significantly from the studio approach. Of these, subjects exposed to the unmodified visual program scored highest on all three measures. The null hypothesis that

the treatments would reveal no significant differences in the three measures was rejected. The premise that verbal interaction increased visual involvement was not supported.

Parallel results occurred at both locations for the four treatments in all three measures. The results can be attributed to treatments rather than location or teacher. None of the measures incorporated visuals from the slide program. The improved discrimination can be attributed to a changed mode of discrimination (progressing from the literal to the descriptive, analytic, and interpretive) rather than recognition.

This study supports the position that discrimination of the aspects of art can be developed by visual instruction. It also considers the value of teacher produced visuals as one means of the presentation of art aspects and of developing progress discrimination. In response to current demands for tangible methods and curricula, it supports more extensive use of the new media by both teachers and students.

REVIEW

David Hysell
Rhode Island College

Statement of the problem. The title phrase visual differential seems to have been derived from prior observations that students who experienced visual training modules tended to feel better equipped in approaching works of art as well as possessing a greater idea and image inventory for their own art works. For the purpose of clarity in this study, however, that phrase might just as well be omitted. Essentially, Stieglitz tests the effectiveness of a programmed treatment of shape discrimination on groups of college non-art majors at two different college campuses. Besides a control group presented with traditional studio-oriented experiences, three treatment variations were designed: a) a group presented with a visual program consisting of five units, each containing twenty slides, accompanied with a co-ordinated written commentary; b) a group presented with the same visual program of slides but here the commentary was 'built by the interaction of students and instructor:' and c) a treatment group presented with the same visuals but additionally involved with photographic media in producing their own images and demonstrations of shape.

Stieglitz assumes that perception is organized in a hierarchy from basic detection and increasing toward complex characterizations. She also assumes that learning can be categorized in a hierarchy from relatively passive looking and listening activities toward student-involved learning activities. Identifying hierarchial listings often help to clarify complex variables and unless one treats such listings as generalizable and attaches values to them, they are relatively harmless. This reviewer is not too concerned with these listings for he doesn't feel they warrant a high degree of attention, but a third hierarchial assumption which is the real basis of the problem statement needs to be analyzed. This third assumption involves the hierarchial structure of art and aesthetic response. Stieglitz states that 'the primary structural aspects of art are...the elements of design and visual form' and that these elements can aid in providing a 'foundation for aesthetic awareness.' She even goes further to say that 'an active study of the elements is indispensable to the perception of art and the amplifications of the total visual experience.' Such assumptions must be questioned here for Stieglitz has done nothing in her study to firmly support, document, or even acknowledge the problem of structure in art but has seemingly accepted the Bauhaus tenet as truth.

The so-called elements of design are indeed a structure within the domain of art and one may indeed utilize an aspect of such a structure as an experimental variable in a dissertation study, but unless one qualifies the selection, the entire study becomes open to serious questioning. While this reviewer is reluctant to substitute an alternate structure and certainly not a hierarchial one, he believes he can substantiate that the 'elements and principles' are one of the components of formal aesthetic organization and, along with material properties and subject, theme, or idea, one of three primary aspects in works of art from which descriptions, relationships, and perceptions of expressive qualities are derived.[1] Abel,[2] Broudy,[3] and Hospers[4] in analyzing writings of art critics, art historians, and art philosophers have identified similar aspects.

In any event, the decided trend is to acknowledge multiple structural aspects rather than linear hierarchial ones. And if we wish to focus upon art learning instead of art as a discipline, Ecker's[5] suggestion of affect as a structural component needs to be considered as another dimension.

Research objectives. This study hypothesizes that: 1) results on multiple measurements of shape discrimination will differ with the four training

approaches, and 2) as visual involvement increases (as indicated by the hierarchial ordering of groups 1 - 4) visual discrimination will increase.

Related research. Although longer than any other in the study, this chapter tends to be fairly general in scope and little research cited pertains directly and specifically to the subject of the study. Omissions of pertinent research on perceptual hierarchies and structure of art and aesthetic perception are quite noticable.

Methods and procedures. It seems that extreme care was taken in the design and instrumentation of the experiment. An unusual feature of the design was a built-in replication where a control and three treatment groups were tested at two different locations in two different cities. This means that eight groups totaling 160 subjects were utilized. And amazingly, the resulting scores in each of the two locations are practically copies of one another.

Essentially, the experiment used a four-group, post-test only design with random assignments of the treatments to in-tact groups. Pre-testing was omitted supposedly to insure against the sensitization of any of the groups to the measures. Although not always necessary, pre-testing does help insure equalization of the groups and is especially important where random assignment of subjects cannot be accomplished. One group became the control for the other three, thus:

Group 1 - (control) studio-oriented
Group 2 - visual program w/co-ordinated commentary
Group 3 - visual program w/interaction commentary
Group 4 - visual program w/photo involvement

Three well-conceived instruments were devised to assess change in the students mode of discrimination of shape. Three measures were used to increase internal validity since an internal process not directly observable was being tested. One instrument attempted to verbally obtain a subject's qualitative mode of perception toward works of art. A single word response was requested upon viewing each of ten slides of paintings after a period of one minute. These words were later classified as literal, descriptive, analytic, or interpretive with words in the latter classifications receiving the highest points.

The second instrument used warrants further use and development. The subject was asked to select pairs of art works according to similarities in their visual characteristics. A set of four large reproductions was used possessing characteristics that allowed pairs to be selected according to subject matter, formal arrangement, and style. Thus, there were two pairs with similar subjects, two with similar physical qualities, and two with similar styles. The pairs, however, were never the same.

The third measurement was a two-dimensional design problem using identical circles and two colors as limitations. Judgments by three art instructors were based on figure-ground interaction, shape organization, shape selection, and total creative impact. A point that this reviewer would like to make is that the treatment focused not only on shape but specifically on circles. Therefore, all treatment subjects were somewhat sensitized to circular forms and interrelationships. Since the control group did not have recent experience with circle shapes, this might seriously jeopardize the results of the design problem measurement.

Results. Results of tests from the two locations, Madison and Milwaukee, were calculated separately as well as being combined. The treatment groups proved significantly different from the control group except where the third group (visual program w/interaction) was paired with the control. The scores of the Madison groups were consistently higher than the Milwaukee groups.

The second measure, the selection of pairs test, was calculated in terms of percentages with group 2 (visual program w/co-ordinated commentary) making the greatest number of 'style' selections and the control group making the least. The design problem measure was calculated in frequence and percentage. The means showed that treatment groups 2 and 4 scored highest. A chi square statistic indicated that scores on the 'total creative impact' factor were dependent on the treatment as these scores were significant while scores on the other three factors were not. Correlations between the test instruments showed that only scores between the verbal response test and the design problem test were significantly correlated.

Summary. The assumed hierarchy of the treatment group design proved erroneous since group 2 which did not involve students with interaction or involvement scored highest on most measures. Since the scoring pattern

for groups was extremely similar for both locations it appears that the results achieved were independent of instructor or location. Stieglitz writes that 'as the test items were all independent of any in the visual program, the improvement cannot be said to be a result of recognition or familiarity.' This may be true for two of the tests but independence of the third design problem test is questioned. The most important implication of this study is that visual discrimination modes can be learned and that such training can supplement existing approaches, rather than supplant them.

Reviewers commentary. Most of this reviewer's comments have previously been stated. A major weakness of the study was the neglect of securing adequate theoretical foundation for the basic assumptions of the problem. Perhaps Stieglitz realized this for twice she refers to a greater demand at this time for development of curricula than for a detailed theoretical structure. Although one might argue toward this viewpoint, it does not excuse the serious researcher from inadequate foundation.

The methodology of the experiment was commendable. Only one flaw in the instrumentation was observed. The development of two of the instruments show promise and should be further improved and tested for if research in visual perception, and particularly aesthetic perception, is going to increase, more and better measurements are needed.

Another implication of this study (which the author did not acknowledge) is the effectiveness that programmed learning continues to demonstrate. Perhaps the area of programmed visual training should be revisited.

FOOTNOTES

1. See David Hysell, 'Testing an Advance Organizer Model in the Development of Aesthetic Perception,' *Studies in Art Education,* Vol. 14, No. 3, Spring 1973, 9-17.

2. Walter Abel, 'Toward a Unified Field in Critical Studies,' *Aesthetics and Criticism in Art Education,* ed. R. Smith, Chicago: Rand McNally, 1966.

3. Harry Broudy, 'The Structure of Knowledge in the Arts,' *Education and the Structure of Knowledge,* ed. S. Elam, Chicago: Rand McNally, 1964.

4. John Hospers, 'Problems of Art,' *Aesthetics and Criticism in Art Education,* ed. R. Smith, Chicago: Rand McNally, 1966.

5. David Ecker, 'The Structure of Affect in the Art Curriculum,' *Art Education,* Vol. 24, No. 1, January 1971, 26-29.

REVIEWER

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DEVELOPMENT OF A THREE DIMENSIONAL CONCEPTUAL MODEL OF TEACHER VERBAL BEHAVIOR IN THE COLLEGE STUDIO ART CLASS

Edward Roger Bleicher, Ph.D.
The Pennsylvania State University, 1972

ABSTRACT

Area of Investigation

Under the assumption that the college studio art class is exemplary among curricular forms in higher education with regard to certain humanistic aims of education, this study undertakes to initiate the development of a system for description of this type of class. In particular, the study attempts to find substantiation for categories to describe teacher talk in the three types of college studio art classes. These categories fall within three separate dimensions of teacher talk, which are: Scope, or the relative breadth or restrictedness of the teacher's frame of reference; Content, or the relative abstractness or concreteness of the course substantive matter as presented by the teacher; Climate, or the relative teacher orientedness or learner orientedness displayed by the teacher in the feeling tone which he establishes in the classroom. This study also seeks some substantiation for a hypothesized interrelation between these dimensions which is dependent on the mode of teaching being engaged in by the teacher. The modes of teaching are identified as follows: (1) Individual Discussion, occurring when the teacher circulates among the students and discusses particular works and ideas with single students; (2) Group Discussion, occurring when the teacher engages in talk with two or more students and allows the discussion leadership to pass among members of the group; (3) Lecture-Demonstration, occurring when the teacher addresses himself in monologue to one or more students. The hypothesized interrelation between these dimensions and modes posits that the teacher is freest and most open in Group Discussion so the pattern in that teaching mode will be most learner oriented, most abstract and most open; that he is most rigid and closed in Lecture-Demonstration and so the pattern in that teaching mode will be most teacher oriented, most concrete and most bounded; and that in Individual Discussion he is most subject to variation, so that in that teaching mode his talk with regard to Climate, Content and Scope will be a thorough mix of categories.

Procedures

Data were collected from actual college studio art classes in the form of tape recordings. These data were coded, or categorized on dimensions derived from the model, by the researcher and three other coders. To assess the reliability of the descriptor categories as a descriptive instrument, the codings were subjected to the Pearson product moment correlation test. To establish some measure of validity for the construct of the teaching modes in interrelation with the dimensions, an analysis of variance was performed which examined the difference among the three teaching modes with respect to their hypothesized characters in terms of dimension categories. To further build validity for this construct, individual t tests were performed which examined differences between all pairs of samples included in the analysis of variance.

Conclusions

Very high positive correlation coefficients between pairs of codings led to the conclusion that the descriptor categories would function reliably as a descriptive instrument. A significant F ratio computed in the analysis of variance led to the conclusion that there is significant difference among the samples representing the three teaching modes and suggested that comparisons of each pair of samples would be appropriate for ascertaining where the significant variance lay. Such comparisons were performed through the t Tests and it was found that significant difference existed between Individual Discussion and Group Discussion, between Group Discussion and Lecture-Demonstration, but not between Individual Discussion and Lecture-Demonstration. The main conclusion of this investigation is that while the categories will function reliably as a descriptive instrument and that while some case may be made for the validity of the construct made up of the dimensions, the teaching modes and their interrelation, further validity may be built on results of investigations which draw on larger samples and which employ more refined criteria for teaching modes.

REVIEW

Richard A. Salome
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Statement of the problem. In the sixth and final chapter of this study the problem is described as, '...an investigation of three dimensions of teacher verbal behavior in the college studio art class, three modes of teaching in the college studio art class, and ways in which these modes and dimensions relate to one another' (p. 56). It is difficult to clarify the problem in earlier chapters, possibly because the study does not seem to be rooted in a framework of theory or previous research. The basis for the investigation appears to be Mr. Bleicher's belief that the college studio art class is a distinct curricular form. He states, 'It is the construction of the studio class and the potential held by that construction for the richest kind of education, regardless of substantive material, that is posited as its value' (p. 2).

On ending the introductory chapter, he indicates that studio art classes have built in potential for making education and living more human and proposes a systematic description of such exemplary behavior as it is practiced (p. 3).

In the next chapter, the purpose is, '...to contribute to a systematic description of the total phenomenon which is the studio class and to provide insights pointing the way to conservation of certain elements, elimination of others, and adaptation of certain elements for use in other disciplines' (p. 7).

Chapter three, entitled Statement of the Problem, indicates that, 'This study seeks to identify and explore the relationships between three dimensions of teacher verbal behavior in the college studio art class.' On the same page, 'It is hypothesized that by means of categorization of teacher talk an index of three related dimensions of teacher behavior may be established' (p. 13). This is not a hypothesis, but an aim or goal which it would seem necessary to achieve before exploring relationships between three dimensions of teacher behavior as mentioned earlier.

The paragraph on scope and limitations indicates that the purpose of the study is to '...focus on the verbal behavior of the teacher as it exists in the

college studio art class. It will attempt to develop and test an instrument which is sensitive to this verbal behavior' (p. 14).

The importance of the study could be made clearer. The author suggests this investigation will contribute to a larger problem, which is '...to build a model which establishes a theoretical basis for teacher and learner, by their separate behaviors and their interaction, to aim at the learner's self-actualization' (p. 14). On the same page he says the study will provide some means for systematic examination of the studio art class as a curricular form. More attention should have been given to explaining the need for this investigation and implications for application of knowledge resulting from it.

Related research. Chapter two, a six page review of literature was divided into four sections: Theory of Art Teaching, Research Methodology, Methodology of Artist-Teachers, and Humanistic Education and the Studio Class. The references are of a philosophical nature, with the exception of an anthology of observation instruments. The chapter opens with, 'The major premise of this study is that the studio class is a unique phenomenon in the college curriculum' (p. 5). Several quotations are included under the first section which presents opinions concerning the uniqueness of art experiences. Only one reference, an anthology of observation instruments, appears under the section in which the author provides one sentence descriptions of seven observation instruments. No explanations are provided. The other sections are equally brief.

The investigator notes that a perusal of the literature did not yield a systematic description of the college studio art class, which is the purpose of this study (p. 7). No discussion of studies concerning teacher behavior in other subject areas is provided. The review presents beliefs and opinions of other writers, which may or may not be true. concerning the uniqueness of the art class. The author indicates concern for the lack of individuation in education, the danger of technological automation, and the need for a system which will insure pursuit of truth, wisdom, knowledge, inner life, individuation and humanistic education. He apparently believes the studio art class is capable of promoting all of this. Unfortunately, no evidence is provided to support the premise that the studio art class is either a unique phenomenon in the college curriculum, or a type of class which can fulfill any or all of the above requirements. The author

suggests a strategy to be used in this study but does not substantiate why his route is the best to follow, nor is it clear where it might take us.

Research objectives. Chapter III, entitled Statement of the Problem, indicates that an objective of the study is to identify and explore relationships between three dimensions of teacher verbal behavior in the studio art class. It is posited that by categorizing teacher talk, an index of three related dimensions of teacher behavior, scope, content and climate, may be established. Bleicher presents two test hypotheses: 1) the researcher and three other coders of teacher talk will, with appropriate training, be able to employ the preceding dimensions and their respective categories to codify teacher talk reliably; and hypothesis 2) case for the validity of the construct, which is the inter-relatedness of the three dimensions, will have its foundations laid by this investigation (p. 14).

These are aims, rather than hypotheses, and the first one is the kind of thing that should be done prior to the investigation, or in a pilot study to insure that the researcher had an instrument to work with. Farther, it is not a direct outgrowth of the problem statement which was to investigate three dimensions of teacher verbal behavior and three modes of teaching in the college studio art class, and ways in which these modes and dimensions relate to one another (p. 56). One is asked to give considerable status to the researcher's hunch that an index of three related dimensions will be established through categorization of teacher talk without a ground work of supporting evidence. The second test hypothesis seems quite untenable. How does one prove that foundations have been laid? These statements might best be described as declarative, suggesting an anticipated relationship between variables, but they lack clarity.

This chapter also includes a paragraph on limitations which is directed mainly to continued clarification of purpose, rather than the limits of the study. More could be said about what was included and excluded, conditions, restrictions, population, etc.

Methodology. Over one-half of Chapter IV, Procedure of the Investigation, is given to describing a pilot study. Two university art classes were used as an available sample in the pilot study. No description of the groups concerning characteristics relevant to the objectives of the investigation was provided. One must question the researcher's position that the two sample

classes, one in printmaking and the other in sculpture, taught by graduate assistants in art education '...are at least nominally representative of studio classes in higher education' (p. 16). Use of groups at hand precludes generalizations to other, or larger groups. What the researcher got was a description of the information variable for the groups at hand - that is, what the two groups included in the pilot were like in terms of the measured variables.

No statement of purpose is included for the pilot study, but apparently the aim was to establish the reliability of an instrument for categorization of teacher talk. Criteria for categorization of teacher talk were established by the researcher prior to any coding activities (pp. 17-19). The basis for establishment of these criteria is not explained. The organization of this chapter makes comprehension difficult. The dimensions into which teacher talk are to be categorized are discussed on pages 17-19, and it is not until pages 26-27 that another set of variables called modes of teaching, including group and individual discussion and lecture-demonstration were used in the assessment.

Having established the three dimensions of teacher talk, and the categories included in each, the experimenter went through a period of self-training, and coded teacher talk from taped sessions of the sample classes. He then '...developed a system of weighting whereby sets of two or three frequency counts could be transformed into a single number which could be plotted on a graph' (p. 20). No explanation of the procedure, or the reason for doing so, other than being able to plot on a graph are offered. The reader is referred to a table and several graphs to work out the system for himself (pp. 21-24). Table 1 indicated that a weight of 3 was given to learner oriented responses and a weight of 1 was assigned teacher oriented responses in the Climate dimension (p. 21). Apparently the researcher feels that learner oriented responses are three times as important as teacher oriented ones, but no rational for weightings is given. Frequencies for teacher and learner oriented responses were eventually converted to one score for a graph on which there were mistakes for the plotting of the first scores for the dimensions Climate and Scope (p. 22).

A table entitled 'Climate Indices' presents frequency of learner oriented statements divided by frequency of teacher oriented statements for each of eight five minute time segments that were evaluated. Two errors

occurred in this table, where 0 learner oriented responses were divided by 26 teacher oriented for a value of .04. and again when 0 was divided by 10 for a value of .10 (p. 23).

In discussing a 'Climate Index' graph, the author notes the similarity between it and an earlier graph and writes. 'It is inferred that when transformation is applied to the data in the dimensions of Scope and Content, the data is obfuscated to no greater degree than it is in the dimension of Climate when it is thus transformed' (p. 25). On the one hand, the meaning of this statement is not clear, and on the other, no data is provided to support it. Providing no explanation for the transformations of data leaves the question - why do it?

A description of the 'main study' begins on page 31, disclosing some important limitations that should have been recognized. The sample population was located in a school of art where the major orientation of the curriculum is for the preparation of professional artists (p. 31). Secondly, information concerning judges for the main study indicates only that their training '...was of essentially the same nature as the judge training for the pilot investigation' (p. 32). Page 62 of the summary chapter discloses that the judges were graduate students in Art Education. No information is provided concerning their qualifications. In discussing procedures for taking samples from tapes made of recorded classes, it was pointed out that 'In certain instances there was no possibility for random selection; that is, only the talk of one or two teachers met the criteria for selection' (p. 36). Apparently, in four of the nine periods of recorded teacher talk, the experimenter selected teachers who would produce data representing two of the three teaching modes. There should have been a clear and concise statement of the criteria for selection at this point. This also raises the question of whether or not results of the study were affected by drawing random inferences from partially nonrandom samples.

On pages 35 and 37 hypotheses concerning relationships between teaching modes (individual discussion, lecture-demonstration and group discussion) and the dimensions of scope, content and climate are presented. This clarification of the study's purpose should have appeared much earlier! One hypothesis states that, '...variation in patterns of verbal behavior across teachers, as it is measured by the criteria of Scope, Content and Climate and of the three teaching modes listed above, is a function of

individual differences among teachers and *not* a function of any of a variety of variables which operate in these data, such as: semester, ... semester segment ...; time at which class met ...; discipline (painting, printmaking, sculpture)' (p. 37). The author dismisses all of these variables, to say nothing of those not mentioned such as instructor experience, teaching load, experience and motivation of students, etc. It occurs to this reviewer that variables such as these may greatly affect what we call individual differences in instructors. Intervening variables which are not controlled or measured can have important effects on the outcomes of an investigation. The researcher's challenge is to find ways to neutralize them, or certainly to recognize those he could not cope with in discussing the validity of the study.

Results and discussion. Chapter V of this study presents the data for correlation tests to determine inter-judge agreement, the relatedness of codings for each dimension, an analysis of variance and t tests. The author tested the hypotheses regarding the interrelatedness of teaching modes and dimensions of teacher verbal behavior through a one-way analysis of variance. As mentioned earlier, a series of transformations from the coders' original scores made this possible. Very little is said about the ANOVA in Chapter V other than that the means of percentage-of-total-frequency amounts in Learner-Oriented Climate, Abstract Content and Open Scope in each of the three teaching modes were significantly different as hypothesized (p. 50). Even less was said about it in the methodology chapter. The 18 scores over which the one-way analysis of variance was conducted are not identified in the study.

The investigation involved two sets of variables, one called dimensions of teacher behavior, and the other called teaching modes. Only one ANOVA was reported. It appears that three one-way analyses should have been run for each teaching mode, or else a two-by-two factorial analysis of variance. Having obtained a significant F ratio for the ANOVA, three t tests were run, using the same illusive 18 data or scores. The reader should have no difficulty in ascertaining what data analyses were based on, nor should there be any question about rationale for the tests used. In this instance, based on the report of the study, it appears that part of the statistical analysis was inappropriate.

Reviewers commentary. Chapter VI of this study is the chapter one should go to for clarification of what was done. The study is plagued with organizational problems, making it difficult to ascertain the investigator's purpose and the significance of the study. The dimensions of teacher behavior developed by the investigator are interesting and plausible. However, no indication is given that the three dimensions and their categories rest upon established theory, assessment of expert opinion, or prior research.

As one advances through the investigation, a concern for researcher bias occurs. The researcher was a member of the same faculty as the instructors and professors utilized as subjects in the study, and the three coders were graduate assistants there. It is possible that knowing fellow faculty members might have caused the investigator to see certain relationships in his observations. He reported that he did not have a truly random sample, but had to select some individuals whose talk met the criteria for selection (p. 35).

The researcher's values appear to have been a definite factor in the study. In discussing the dimension of Content, he states, 'Abstract Content consists of meanings and implications of works and processes, feelings invoked and the like: things of the mind. The hand of the learner, it would seem is much more readily accessible to the teacher, to exercise control over, than is his mind' (p. 38). Later he writes concerning observations in the Content dimension, '...the abstract Content which is evidenced in the time segments 5 and 6 in Lecture-Demonstration, coupled with the strongly teacher oriented Climate and bounded Scope which accompany it indicate that some very vigorous 'shaping' was being performed by the teacher in a Content area in which that kind of 'shaping' may be improper for a teacher to engage in, and indeed is improper in humanistic terms' (p. 74). Objectivit and neutrality are necessary requirements in such a study, but in this instanc the researcher may have let emotional involvement contribute to an unintentional bias.

The reader is expected to accept some assumptions as self-evident, based on excerpts from several philosophical writings. The investigator gives statemen of belief by authors included in the literature review as much status as hypotheses supported by evidence. In the final pages the author defines the first basis for the model predicting interrelationship of teaching modes and dimensions of teacher talk as '... that which exists in teacher verbal behavior in the college studio class, in structural or formal terms.' The second basis

for the model is, '... the way in which this structure, or form, of the studio class may most directly serve the ends of humanistic teaching and learning as those are identified in the first two chapters of this paper' (p. 72). It appears that the researcher assumed the truth of what he was attempting to demonstrate. Basing an investigation on assumptions which are untested, or given more certainty than the evidence justifies makes it difficult to determine the validity of the findings.

REVIEWER

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SOCIAL RESEARCH IN ARCHITECTURAL PLANNING

John Richards Zeisel, Ph.D.
Columbia University, 1971

ABSTRACT

In sociology the physical setting of behavior and perception has been a neglected area of study. In architectural planning the social implications of design have been drawn primarily from intuition and imagination. This thesis is meant to solve the problems of the designer by looking at the relationship between man and the man-made environment from the perspective of the sociologist: using the sociologist's theories and methods. It proposes to find out about the potential users of an environment by observing behavior, observing physical cues and interviewing.

The thesis is organized according to the way I developed my own thinking about the use of sociology in architectural planning. There are two parts. The Introduction discusses one way sociologists and planners have approached the relation between social structure and the physical environment during the past 80 years. A distinction is drawn between market research for housing and the needs research based on functional analysis.

Part One demonstrates how the use of observational research methods are particularly suited to sociological research for physical design. Two research and design projects demonstrate these methods in the design of urban housing.

Part Two concentrates on what type of information, useful to planners of the physical environment, can be found by interviewing potential residents and how this information can be usefully analyzed in connection with observation of data. The research and design of a rural housing subdivision is used as an example.

Although the three studies described translate sociological information into designs for a physical environment, they all differ in the group for whom the housing is planned, the type of research carried out, and the central housing type designed.

The first study in Part One is secondary analysis of Herbert Gans's book, The Urban Villagers. Gans's description of behavioral patterns of the

working-class Italians in Boston's West End was the basis for the design of an urban housing complex. The second project in Part One was carried out in El Barrio, the Puerto Rican community in New York's East Harlem. Planning apartments for low-income Puerto Rican tenants provided an opportunity for direct observation of behavior and also for observing unobtrusive physical cues. The project was sponsored by the Real Great Society, a local community group.

The case study discussed in Part Two is larger in scope than either of the previous two: it includes not only designs for house plans, but also for community layout and site selection. This research and design project, sponsored by IBEC, a large development company, was carried out in Spartanburg, South Carolina, with the cooperation of a black community group. The proposed community, financed under a federal housing program, was planned for low-to-moderate-income southern blacks. Research for the project includes observation with photographs, interviews with potential residents about architecturally relevant data, and the use of drawings to elicit responses about their feelings about the environment.

Discussion of the project is followed by a proposal for the next step in applied social/physical research:[1] evaluating buildings by comparing how the designer thought they would be used to how the buildings are actually used by the residents.

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[1] *This term is used throughout the thesis to describe sociological research which relates to designing and planning the physical environment.*

REVIEW

Richard L. Hoag
University of Illinois

Statement of the problem. In his dissertation, Zeisel, proposes a means 'to solve the problems of architectural planning.' The problem is characterized as a current reliance on intuition and imagination. The solution offered involves the application of sociological theory and method to the study of man and his man-made environment. Zeisel 'proposes to find out about possible users of an environment by observing behavior, observing physical cues and interviewing.' More precisely, Zeisel's study

focuses on the development of design directives derived through applications of sociological methodology. As a second step and conclusion to the study, these design directives were used as a generative base for a proposal for evaluating architectural planning intentions. The responsibility for implementing these design directives rests with Zeisel's architect colleague, Brent C. Brolin.

Brolin acts as collaborator throughout the study. Although Zeisel's responsibility was research and Brolin's was design, Zeisel notes that both performed research and design. Brolin, while building middle-class American homes for Jamaican families, began to question the cultural appropriateness of his physical design interventions. His doubts about these interventions provided the inspiration for the study.

The study is organized according to the way in which Zeisel developed his 'own thinking about the use of sociology in architectural planning.' The methodology of community study is the portion of the sociologist's tool kit that Zeisel selects as the framework for combining the two disciplines. The limits of the problem studied appear broadly conceived, covering the analysis and design of three projects: 1) Boston's West End; 2) El Barrio in New York's East Harlem; and 3) Spartansburg, South Carolina. The care necessary to maintain operational rigor and procedural clarity in a precise study of this scope would challenge the most experienced researcher.

Related research. Community studies are an omnibus body of substance and method. Having selected a problem of considerable breadth Zeisel, in his literature review, restricts himself primarily to the substantive aspects of community. The historical review of the field leads the reader to believe that community sociology is rather clear and definitive; rarely alluded to is the considerable diversity contained in the literature. In this regard, George Hillary's 1955 analysis, 'Definitions of Community: Areas of Agreement,' was not mentioned. Hillary's work points to the enormous difficulties encountered when embarking on an investigation using communit studies as a base. Hillary found minimal 'agreement,' extracting no less than ninety-four definitions for community.[1]

Zeisel concludes his section on 'History of Community Sociology' by saying, 'Interestingly, while the analytic approach and problem definition have shifted, the unit of study has remained the same: a social system with

distinct physical boundaries.' Although this remark certainly sets the stage for combining community sociology with architectural planning, it hardly seems consonant with definitions of community portrayed by Parsons[2] or Sjoberg.[3] Both definitions were much less physicalistic; Parsons almost to the exclusion of physical reference. Zeisel, continuing the review of the material related to his topic, includes two additional categories: a) the history of planning, primarily substantive in content; and b) a discussion of market research and needs research as a basis for the sociologists approach to community studies. Market research is equated with economic research and needs research is equated with psycho-social-physiological research. Although Zeisel, using breakfast cereal as an analogy, elaborates this distinction, it is quite apparent as the discussion concludes that a crisp operational definition for 'needs' and, therefore, its implications, when used in the body of the study, must unfortunately remain with the author.

Research objectives. The research objectives appear to be as follows:
a) 'to demonstrate how the use of observational research methods are particularly suited to sociological research for physical design,' (projects used: Boston's West End and El Barrio)

b) to indicate 'what type of information useful to planners of the physical environment can be found by interviewing potential residents,' (project used: Spartansburg)

c) to demonstrate how this information (2 above) can be usefully analyzed in connection with observation data,

d) to provide a base for a proposal for 'evaluating buildings by comparing how the designer thought they would be used, to how they were actually used by the residents,' (project used: Spartansburg)

e) to show that needs research (as opposed to market research) 'includes recording how they [buildings] were actually used by the residents,' and

f) to show practical ways of analyzing the above data in terms of social function, and to translate the information into useful directives for planning and design decision making.

Methodology. Both substance and method are specified in the objectives listed. The emphasis is methodological. This is a bit surprising, considering the heavy reliance on substantive issues in the literature review. Considering the methodological focus, an emphasis and extended discussion of the methods of both planning and community study would seem a necessary, but overlooked component of the study. Perhaps this can only be attributed to the traditional approach to community studies which seems so eclectic and varied; so determined by the object of study that it led Ruth Glass to equate them with 'the poor sociologist's substitute for the novel.'[4]

Nevertheless, based on his objectives, it is necessary to assume that the primary emphasis of Zeisel's investigation was to develop a method for handling overt social behavior in the man-made environment. With this in mind, it is difficult to understand why Zeisel selected projects that varied on such a large number of dimensions. This variation makes it difficult, if not impossible, to comparatively evaluate either procedures or techniques. (reference Diagram 1)

This is, of course, not an unusual problem, but becomes particularly significant here since Zeisel is attempting the combination of two disciplines whose notation techniques (a combinatorial or independent use of words, drawing, diagrams, and models) differ considerably. Zeisel's problem is compounded for in combining architectural planning and sociology, it is not enough to simply set the information of the two disciplines side by side. The procedures and particularly the notation techniques of the two disciplines must be integrated. The verbal information of the sociological tradition must be clearly and precisely integrated with the visual simulations of architectural planning; not verbal overt social information by itself or visual physical information by itself, but some exacting combination. There exists a tremendous gap between the design directives and their final implementation in design decision making, an unspecified jump from verbal list to visual simulation.

Without social/physical notational crispness there seems little basis for comparatively evaluating design decisions as they relate to the project residents overt behavioral patterns. Perhaps because of his socio-political orientation, Zeisel innocently disregards the importance of controlling his visual as well as his verbal notation techniques. In the investigation these techniques vary on almost as many dimensions as do the projects (reference Diagram 1). To use a simple example, suppose an investigator were interested in comparing

Diagram 1

	Project 1	Project 2	Project 3
Physical setting	Urban: Boston's West End	Urban: El Barrio, New York, East Harlem	Rural: Spartansburg, South Carolina
Social grouping	Italian	Puerto Rican	Southern Black
Economic grouping	middle-income	low-income	low-to-moderate income
Project sponsor	none	Real Great Society (local community group)	International Basic Economic Corp. (large development Corp.)
Housing type	urban housing complex	apartments	rural housing sub-division
Main design components considered	unit plan, complex layout	unit plan	unit plan, community layout, site selection
Research techniques	literature search	behavior observation, unobtrusive observation of physical cues	behavior observation, unobtrusive observation of physical cues, interviewing
Notation techniques for: Analysis	verbal description, symbols	verbal description, 2D diagrams	verbal description, 2D diag., photos, questionnaire, games
Notation techniques for: Synthesis (design decisions)	verbal descriptions, symbols, 2D diagrams, drawings	verbal descriptions, 2D diagrams	verbal descriptions
Data Source	indirect	direct	direct

two substantive objects, two buildings for example. For the sake of expediency the investigator must find some way of representing building 1 and building 2 through drawings, photographs, or diagrams. The investigator selects black and white photographs as his simulation medium. He produces a photograph to his selected group of respondents. The respondents were able to provide feedback concerning the distinctive features of the two buildings with limited interference. Now on the other hand. it would be possible to suppose that the investigator was more interested in comparative evaluation of the representational medium used than either of the two objects (building 1 or 2). This being the case the investigator would attempt to hold the object constant. Instead of using both building 1 and building 2, the investigator would use only building 1 and vary the representational medium, say a drawing and a photograph. At this point the respondents would be able to evaluate the medium used. One can readily see the problems involved in the development of information on either objects or representational medium if both are allowed to vary on a number of dimensions simultaneously.

In a 1971 lecture at the University of Illinois, Urbana, Sommer[5] indicated three major difficulties encountered when social scientists attempt communicating information to designers: a) the questions asked by the social scientist about particular pieces of environment may not be in the designers' vocabulary; b) the questions asked about particular pieces of environment may not be in a vocabulary designers can understand; and c) the questions asked about particular pieces of environment may not be in a vocabulary designers can use. Certainly most of these morphological considerations can be brought to resolution through precise public statements that allow comparative evaluation of verbal constructs within specified communities. However, if attention is not given to the crisp use of terms, assumed understanding between users of a language becomes questionable.

In Zeisel's dissertation, one is often left with the feeling that the inclusion of a number of operational definitions would have added considerable precision and clarity to the study. Native hearers and speakers of a lexicon used in architectural communities would, I believe, have considerable trouble understanding a construct, like functional analysis, when it is used as a subcategory of sociological paradigms. Functional analysis, for example. in the sociological frame of reference requires the definition of a system. This system based on a particular world-view that allows the definition and analysis of components within the system, their relations

and structure. This system can then be treated in metaphoric relation to biologic organisms. These organisms, predicated on the model constructed, then have certain probabilities for survival and effective operation. To the traditional environmental designer, on the other hand, who has been schooled in the tradition of the Bauhaus, functional analysis has roots in the architectural cliche 'form follows function.' Here function is treated as if it belonged to a thing. Function, in this case, has little to do with relational processes and is directly related to physical artifacts.[6] Although the author reviews several historical definitions of functional analysis, a position is never taken on its use in the study.

To purse this point a bit further, it would be interesting to understand whether Zeisel views the community as an object of study or whether he takes the view of Stein,[7] or Havighurst and Jansen[8] and deals with the community as a method of study. This simple distinction should make one uneasily aware of the disparity of view between a number of sociologists and most architectural planners. The architectural planner is inclined to view the community as a physical artifact, an object of study.

The disparity points to the importance of the operational definition in a thesis such as the one Zeisel has undertaken. It seems of prime importance that understanding exist not only between the collaborators, (Zeisel and Brolin) but that the method employed to facilitate this understanding be communicated with precision and clarity.

Reviewers commentary. To sum up, one has little basis for generalizing or assuming Zeisel's approach could be used by any other architectural planner/social scientist team. There is no basis for comparatively evaluating his procedures and techniques in the various projects presented. Even if another architectural planner/social scientist team were to replicate the study, there is little they could compare. One is given no idea about what held the team together or on what basis the designer went from verbal description to visual simulation.

It is difficult to see how anything labeled results could come from this study, except possibly in terms of Zeisel's personal development. Unfortunately, it is easy to grow impatient with the idiosyncracy and non-cumulative nature of both community study and architectural planning especially considering the importance of a cumulative literature

to any field. Literature in architectural planning is in its infancy. Most architectural planners are not yet inclined towards contributions to or the development of a literature; a literature containing solid public information based on the documentation of integrated visual-verbal intentions. With this in mind and considering the state of the art in architectural planning, I must conclude by commending Zeisel's efforts in a difficult area that certainly needs a substantial push towards a public and objective base for decision-making.

FOOTNOTES

1. G.A. Hillary Jr., 'Definitions of Community: Areas of Agreement,' *Rural Sociology,* 20, 1955.
2. Talcott Parsons, *The Social System,* London, Tavistock, 1952.
3. Gideon Sjoberg, 'Community' in J. Gould and W.L. Kolb, *Dictionary of Sociology,* London, Tavistock, 1965, p. 115.
4. Ruth Glass, 'Conflict in Cities,' *Conflict in Society,* London, Churchill, 1966, p. 148.
5. Robert Sommer, Chairman, Department of Psychology, University of California, Davis. For further reference see *Personal Space,* Prentice-Hall, N.J., 1969.
6. Claude Winkelhake, 'The Las Vegas Strip,' *Objective,* University of Illinois, Department of Architecture, Vol. 6, 1974.
7. Maurice Stein, *The Eclipse of Community,* New York, Harper Row, 1964.
8. R.J. Havighurst and A.J. Jansen, 'Community Research,' *Current Sociology,* XV, 1967, p. 7.

REVIEWER

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THE EFFECT OF ART TRAINING ON AESTHETIC RESPONSE STATEMENT PATTERNS

Robert Lloyd Arnold, Ed.D.
Indiana University, 1972

ABSTRACT

The purpose of this study was to test the feasibility of employing a typology for categorization of statements about aesthetic response, and to relate these categories to amount of art training and the psychological meaning of art objects and their components. The typology was developed from the early work of Edward Bullough and consisted of five categories: Objective, Physiological, Character, Associative, and Extrinsic. Ninety-seven college students were tested, of these, 33 were elementary education majors, 31 were undergraduate art education majors, and 33 were graduate students working toward advanced degrees in art education.

All subjects were given a questionnaire to determine the number of hours of college art training that each had taken. A battery of three tests was then administered. The tests consisted of a color response test, in which a like-dislike decision was made for each of ten single colors and reasons for each preference were given, an art object response test, which elicited similar information about two paintings and components of those paintings, and a seven point bipolar test for responding to the paintings.

Data were analyzed using content analysis, Pearson Product Moment Correlation, t tests, and analysis of variance. The results are as follows: 1. The typology is a feasible instrument for categorizing aesthetic response statements. A total of 96.4 per cent of the statements fell into the proposed categories. 2. Statements made in response to single colors correlated significantly with those made in response to art objects and components of art objects. 3. Graduate art education majors produced a significantly greater number of Physiological statements in response to single colors than did elementary education majors. 4. The tendency to make Physiological statements in response to single colors correlated positively with art training. 5. Elementary education majors produced a significantly greater number of Character statements in response to art objects than did art education graduate students. 6. There was a negative correlation between the tendency to make Character statements in response to art objects and art training. 7. There was little or no significant difference

between categories in the use of semantic space along three dimensions: Activity, Potency and Evaluative.

On the basis of these findings, it was concluded that: 1. It appears that similar responses can be elicited by both art objects and single colors. Should this finding be verified by subsequent research, the implication for research technique in the area of aesthetic response statements is important, in that such research would be greatly simplified by the use of single colors rather than actual art objects or reproductions. 2. Traditional college art programs do not increase the students tendency to discuss either single colors or art objects in an objective manner. 3. College art training appears to decrease the tendency to attribute anthropomorphic qualities to art objects. 4. College art training appears to increase the tendency to respond to colors in a physical sense, particularly in respect to hot and cold sensations. 5. Individuals displaying strong tendencies toward responding to visual stimuli in any one of the five categories do not appear to differ to any large extent in their response to the psychological meaning to art objects, as measured by the semantic differential.

An expanded and refined typology also resulted from the study.

REVIEW

Marilyn Zurmuehlen
University of Iowa

Statement of the problem. Arnold clearly indicates his interest in utilizing Bullough's four perceptive types as categories for classifying aesthetic response statements. It should be noted that later he adds a fifth category, Extrinsic, to include those statements which he could not designate as Objective, Physiological, Associative, or Character. He postulates a breakdown in communication between teachers and students in regard to aesthetic responses, stating: 'It should be apparent that difficulties in communication concerning aesthetic matters exist between those individuals who have had training in art and those who have not' (p. 7). If verbalization concerning aesthetic matters includes talk about students' artistic expressions or productions, then it would be appropriate to consider Beittel's[1,2] participant-observer dialogues with students untrained

in art. These seem to be models of considerable communication between student and teacher. The reader should note that the publication date of one of Beittel's references is later than the date of Arnold's dissertation. However, Beittel's work is mentioned not as a critical omission, but rather to support the reviewer's position that perhaps 'breakdown in communication' (p. 6) is a rather strong conclusion to derive from the cited studies which reveal that art training tended to increase formal responses to aesthetic stimuli and that individuals trained and untrained in art frequently have different aesthetic preferences.

The lack of evidence available to substantiate this particular claim certainly does not detract from the value of verifying such a category system for aesthetic responses. It could be useful in clarifying relationships with other variables or as Arnold employs it, to explore a possible association with amount of art training. To the reviewer it seems that, in attempting to establish the significance of this aspect of the study, the writer may have arrived at a confusion of cause and effect. He asserts: 'Should a relationship between type of verbalization and degree of art training be found, a basis for developing programs to change verbalization and to increase sophistication of response could be structured' (p. 10). It may be he is not advocating that changing verbalization will effect the same change in persons as does training in art, but if he is not, then he appears to be suggesting that one of the goals of art education should be to develop the semblance of art training in those not schooled in art. Surely, Child's[3] experience with training children to exhibit agreement with the aesthetic preferences of experts and then discovering that the children's reasons for their decisions often were quite different than those of the experts, indicates the need for caution in making inferences about the internalization of values. Perhaps this is not his meaning, but rather his intent may be to develop programs to change aesthetic responses and to use the category system to measure such changes as they are manifested in writing. One can only deal with the statement as it appears, however. This issue is much deeper than semantic quibbling. Programs to change aesthetic responses not only should be very different from programs to change writing styles, but the two approaches are rooted in quite disparate value systems. A program to change aesthetic responses also raises ethical and educational questions. For one, it assumes some sort of hierarchy among the categories of responses. Although Bullough[4] asserted that the aesthetic evaluation of the four perceptive types presented

no difficulty and proceeded to demonstrate his statement by ranking them from the lowest, the position in which he placed the Physiological, to the Associative, followed by the Objective, and culminating in the Character as the highest. it is uncertain that his values would evoke substantial agreement among present researchers. Indeed, one might infer that Arnold operates from a different ranking premise when he states, '...it seems very strange indeed that individuals who are highly trained in art respond in a manner that is similar in objectivity to those with almost no training' (p. 95). He also indicates that he would disagree with Bullough's evaluation of the Character type when he observes: 'Such a statement indicates that an anthropomorphic quality has been attributed to the object. This type of response appears to be rather naive,' and further, '...it is doubtful that those individuals with art training would tend to make such responses, since they have probably learned that such responses are considered naive, if not childlike' (p. 96). Bullough's hierarchy may be judged as deductive or as arbitrary, probably as a function of one's agreement or disagreement with it. In either case its validity has not been established. This problem might be remedied by using agreement with experts as the basis for the ranking of categories. However, both procedures are open to charges of elitism. Thus, the reviewer would be much more sympathetic to a case for significance to the field of art education which is based on providing teachers with a tool which might give them insights into the aesthetic response systems within which each of their students functions.

Arnold's choice of a semantic differential as a means of eliciting data for comparison with the perceptive types, not only presents the opportunity for exploring another relationship, it may have an additional value. Because of the semantic differential's widespread use with visual stimuli an association established with it could contribute credence to the Bullough category system. This would seem a sufficient reason for including the comparison in the research problem; however, the writer maintains that should such a relationship be discovered, '...art educators would have a basis for directing students toward desired behaviors in this area' (p. 10). Perhaps. Or they might have a basis for talking with students about art objects in ways that are most meaningful to the students.

Since Bullough's perceptive types were based on tests he conducted with colors, sometimes single and on other occasions in combinations, one is

tempted to infer that this is the reason for Arnold's interest in testing responses to single colors, although he does not state it. His decision to compare responses to colors and to art objects from the same subjects seems a logical extension from his concern with Bullough's work and from the controversy which he notes about the validity of aesthetic responses evoked by simple stimuli.

Related research. The division of the review of literature into sections dealing with The Development of Aesthetic Behaviors, The Effect of Art Training on Aesthetic Behaviors, and Categorization of Aesthetic Response Statements is most helpful in developing continuity among the large number of studies discussed. This chapter is thorough and competent; however, the inclusion of thirty-two pages on The Development of Aesthetic Behaviors is a little puzzling since the Bulley & Burt (p. 36) study is the only one cited in it which attempted to consider special training in art. The remainder investigate the effects of age on aesthetic judgments. Since age was not a variable to be studied in the dissertation one supposes that the review was done in preparation for some future research. (Indeed, under Suggestions for Further Study one discovers that this is the case.) It may be useful to readers, but it is not essential for identifying any theoretical basis in the study. A section Defining the Art Object also seems curious since the emphasis in the dissertation is placed on investigating types of verbal responses, rather than on eliciting information about art objects.

Research objectives and methodology. The research objectives and hypotheses are clearly set forth. The only question which arises is why the decision was made not to use a statistical method for testing the hypothesis that data from the color preference test and the object evaluation test can be grouped in five categories (Objective, Physiological, Associative, Character, Extrinsic). Since using several judges to categorize the statements and reporting the extent of their agreement is such an obvious procedure it must have been considered and rejected. It would be interesting to know the reason. Since the objective states the intent to measure the number of statements in each of the five categories the non-statistical procedure is logically consistent. A statistical method would have added power to the conclusion about the usefulness of the category system; however, the results are quite accurately reported as feasible.

The application of statistical procedures to analyze the data is impressively competent and thorough. For example, analysis of variance revealed slight differences between the levels of training as manifested in the responses to the colors and to the paintings from individuals classified in each of the five categories. However, these differences were not consistent so he employed a Pearson Product Moment Correlation analysis between number of responses in each category and number of credit hours. This procedure disclosed a significant positive correlation between art training and the tendency to make response statements in the Physiological category in response to colors; and a significant negative correlation between art training and the tendency to give Character responses to non-objective art objects.

In considering the testing methods it seems curious that three judges were used to ascertain that the two paintings employed in the study were art objects, but that 'The basis for selection was not the relative merits of the paintings...' (p. 55). The stated criteria of non-objectivity, portability, and artists unknown to the subjects would not seem to have precluded a consideration of merit. Also no reason is advanced for presenting the colors one at a time for the subjects' responses, yet showing the two paintings simultaneously to them.

Since it is not reported who classified the statements into categories it must be assumed that the investigator did so. In this case, credence in the category system might have been enhanced and the study considerably enriched by reporting samples of the response statements. Another addition of possible help to readers would be the inclusion of Bullough's directions in the Appendix.

The writer is to be commended for pointing out possible weaknesses in the painting stimuli which might be responsible for the similar responses to single colors and to paintings. These are their lack of literal content and their relatively simple surfaces.

Results and discussion. The significant correlation between verbalizations generated by single colors and by paintings as manifested in the investigator's ability to classify them in one of five categories needs to be examined not only for what it indicates about verbal responses, but also for what it reveals about this category system as an instrument and about

the researcher's categorization. Without access to the original statements it is impossible to determine what, if any, crucial differences exist to which the category system is not sensitive.

The emergence of learned styles or patterns for describing responses does seem justified by the data. This possibility appears to hold considerable potential for additional study.

The statement that the typology is a useful device 'for analysis of the writings of professional art critics' (p. 98) cannot be attributed to any data reported in the dissertation. As a speculation it properly belongs under Suggestions for Further Study where it reoccurs.

An expanded system of ten categories, Evaluative, Preferential, Intentional, Historical, Objective, Physiological, Associative, Character, Extrinsic, and Functional, is included in the Conclusions section. The author reports that these refinements were suggested by the response data. They appear to allow finer discriminations which should enrich future research involving aesthetic response statements.

Reviewers commentary. A primary purpose of this study was to compare responses to both colors and art objects by the same subjects. Arnold states that the results of this comparison may indicate whether subjects respond in a similar manner to both simple and complex stimuli, and that they may establish guidelines for choosing stimuli for research on aesthetic response. Another way of putting this objective might be to say that he was searching for an instrument which does not discriminate between responses to single colors and to art objects. For what purpose? Because, as he notes, the use of single colors as stimuli would simplify research on aesthetic response statements. No one would quarrel with the position that the physical management of sheets of colored cardboard is easier than handling art objects: the cardboard sheets require little storage space, the monetary investment in them is relatively slight, and should they be lost or damaged they can be replaced with assurance. This much is obvious; an additional advantage accruing to the single colors as stimuli is that they do not confront the researcher with the problems of controlling for such awkwardly complex factors as variations in subject matter, in media, in scale, in style, and in the subjects' previous learning in art. When these factors are compounded further by considerations of

the interactions among them, one can understand the appeal of single factors as stimuli; indeed, researchers in the field of psychology have utilized single colors, sounds, and smells as stimuli for responses which they have termed 'aesthetic'--a procedure which Arnold is aware has evoked controversy. In fact, he relates some of the history of this dispute to establish the need for this aspect of his study. Unfortunately, one searches in vain for a concern expressed that such an instrument might simplify the aesthetic responses as well as the research procedures.

What are the research applications for a system of categories which does not distinguish between responses to colored sheets of cardboard and to art objects? Clearly, it will not generate much information about works of art. Its most fruitful implication seems to be for investigating styles of verbal responses. As Arnold states: '...there seems to be a certain consistency in the way that people describe their responses to aesthetic stimuli. This would seem to imply that individuals learn a style or pattern for describing responses, and that this style remains consistent as the type of stimulus changes' (p. 94). Such a tendency might be supported by categorizing verbal responses to a variety of stimuli, such as music, writing, dance, and people. If significant agreement across stimuli did verify such styles they might be useful for exploring relationships with other variables. The findings in this dissertation suggest that there is little relation between categories of response and art training. There is a possibility that a comparison with age might give support to a developmental foundation for these categories, but the nearly equal numbers of subjects classified in each of the four Bullough categories in this study does not seem to encourage such an approach.

Finally, the author presents in the Discussion some sensitive qualifications which do not appear in the objectives, hypotheses, or results. For example, after expressing surprise that individuals who are highly trained in art respond in a manner that is similar in objectivity to those with almost no training, he adds: 'Perhaps attempting to train students to be totally objective in response to aesthetic stimuli is an exercise in futility, in that, regardless of the amount of art training people receive, aesthetic experience is enriched by subjective responses. It appears to be a natural state of affairs for individuals to attend not only to the surface counters of an art object but also to the feelings that that object is generating within them. It may be that people can be taught to be increasingly aware of the

surface qualities of an art object, while at the same time retaining their subjective involvement with the object' (pp. 95-96). To the reviewer this kind of concern enriched the dissertation as well.

FOOTNOTES

1. Kenneth R. Beittel, *Mind and Context in the Art of Drawing* (New York: Holt, Rinehart, and Winston, 1972).

2. Kenneth R. Beittel, *Alternatives for Art Education Research* (Dubuque: Wm. C. Brown Company Publishers, 1973).

3. Irvin L. Child, *Development of Sensitivity to Esthetic Values.* U.S. Department of Health, Education, and Welfare, Office of Education, Cooperative Research Report No. 1748 (New Haven: Yale University, 1964).

4. Edward Bullough, 'The 'Perceptive' Problem in the Aesthetic Appreciation of Single Colors,' *The British Journal of Psychology,* Vol. 2, 1908, pp. 406-463.

REVIEWER

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AN ANALYSIS OF THE RELATIONSHIP BETWEEN THE GESTALTEN OF THE PROBLEM PRESENTED TO SUBJECTS AND SYNTHESIS BASED UPON THREE ADAPTATIONS OF THE TORRANCE TESTS OF CREATIVE THINKING

Dorothy Funk Werblo, Ed.D.
University of Georgia, 1972

ABSTRACT

The ability to synthesize the various aspects of the environment is one of the levels of cognitive development that has been neglected by many educators. It was the purpose of this study to analyze the relationship between the gestalten of the problem presented to students and their drawing responses to determine which of three different structures would elicit most successfully synthesizing responses.

The instruments used were three adaptations of the experimental repeated square form of the Torrance Tests of Creative Thinking (TTCT).

All of the seventh grade pupils in a junior high school in a southern city were tested simultaneously during their home room period. Test instruments were randomly assigned to the various homerooms. The directions and time limits were the same for all groups.

The four hypotheses were: (1) subjects who received the adaptation of the TTCT which presented a paired gestalt would exhibit more fluency in their drawing responses than subjects receiving other adaptations; (2) subjects who received the adaptation which presented a paired gestalt would make more synthesizing responses than subjects receiving the other adaptations; (3) subjects who received the paired gestalt adaptation would utilize a greater number of squares in making the synthesis responses than those receiving other adaptations; (4) more subjects from the paired gestalt group would synthesize than from the other groups.

The first hypothesis was not confirmed. Hypotheses two and three were confirmed and significant at the .01 level. The fourth hypothesis was confirmed and significant at the .001 level.

The confirmation of the hypotheses concerning synthesis suggests that the paired gestalt adaptation of the TTCT can be used to elicit the synthesizing response. Students who responded by synthesizing to the standard repeated figure form of the TTCT were found by Torrance to become more creative adults. With materials designed to elicit synthesis, educators may be able to develop the ability to synthesize. Teachers and publishers can utilize this knowledge to structure page make-up.

This research also deals with the question which has concerned educators for many years: 'How much structure or guidance is needed to achieve the maximum discovery learning?' The distance between squares on each of the instruments can be considered analogous to the amount of guidance given in a discovery learning situation. The findings indicate that the paired gestalt adaptation elicited more synthesizing responses than the other two adaptations. The effective distance was achieved by the utilization of the law of proximity as represented by the paired gestalt.

REVIEW

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Statement of the problem. An attempt is made to show the need for this study by accounts of:

a) a personal observation of the exclusion of grades for problem solving, creativity, flexibility, planning, analysis, synthesis, etc. from report cards (p. 1);

b) quoted material from another writer that asserts that undue emphasis is put on rote learning and that non-conformist behavior of creative individuals is punished in schools (p. 2);

c) quoted material from another writer that asserts that innovation is better accepted when perceived as additions rather than threats and the investigator deduces from this that innovative changes of textbook structure is more apt to be accepted;

d) an assertion by the investigator that some teacher prepared tests overwhelm children and that it is due to the fact that teachers are generally... 'unaware of gestalten' (p. 3): and

e) one instance of where a test was made ambiguous by a teacher unaware of gestalten.

The exact theoretical connections between the information included the above and the experimental aspects of this study are not clearly shown.

Although not stated in these terms in the study, the purpose of the study can be characterized as an attempt to ascertain if drawn squares of identical dimension set in patterns of different proximities to each other (which the author calls 'gestalten of the problem') can evoke analyzable responses in subjects in terms of:

a) relating the squares by including more than one square in a drawing and thus exhibiting 'synthesis;' and

b) by counting the number of squares utilized in drawings attained in a given time and which number is taken to indicate the degree of 'fluency' in the individual subjects (p. 4).

It is not made clear what the actual educational significance of the study is. For example, the most distinct assertion in connection with this is as follows

> *The structure of the material presented to children should serve an educationally sound purpose. This study is directed to the testing both a method for encouraging synthesis and a rationale for the need for subjects to synthesize (p. 4).*

But as can be seen even here, the connection between the first and second sentence in the quotation above is ambiguous. One could infer from this that the educational material should be structured to facilitate synthesizing. This is noted here because this sort of treatment is exhibited throughout much of the study, i.e., it is left up to the reader to infer connections between statements and sometimes even the meanings of important concepts. It is further attempted to show the significance of the study by:

a) quoting Bruner's assertion that the environment has to be manipulated to enable a learner to utilize material in a variety of situations; and from this, Werblo derives that written material can be manipulated for better learning (It is meant here, I surmise, that we should further infer that findings here will hold for written materials as well as for figural);

b) reminding us that Bloom's taxonomy has alerted all to the need for including synthesis in school curriculum and further asserting that educators have been slower to take the cue than scientists and industrialists;

c) mention of brainstorming techniques as discussed by Gordon in his book *Synectics;*

d) the assertion that metaphors are effective in conveying messages;

e) the assertion that insight can be gained by personification of inanimate objects;

f) giving examples of two inventions arrived at through synthesis, i.e., the using of flippers for aquatic sports as seen in fish and sonar from study of the guidance system of bats; and

g) by a quotation from Papenek asserting that as... 'we go towards the year 2000...' there will be a need for more synthesists and less specialists (p. 7).

In connection with the above, the investigator states that it is her hope that this study (and others that follow) will prepare us to educate for that time. The foregoing detail is given here for the purpose of giving force to the assertion by this reviewer that the attention given to the logical aspects of this study is most minimal.

Related research. The second chapter deals with a review of related literature. According to the investigator, the multiple themes interwoven here are a) Gestalt Psychology, b) discovery learning, c) synthesis, and d) the Torrance Tests of Creative Thinking. Yet, much of what is included here does not have apparent relevance to the design of the study. That this

seemingly unrelated literature is in fact related cannot be ascertained because there is no attempt by the investigator to show a coherent theoretical structure underlying the whole body of literature presented. It is clear to this reviewer that it would be the reader who must structure relatedness into this body of literature--a task that might be greater than the one undertaken in this study. There is reference material and discussion under the following headings: Gestalt Psychology, The Gestalten as Nonverbal Communication, The Gestalten as Subliminal Stimulus, The Need for Utilization of Gestalt Psychology, Gestalt Psychology and Discovery Learning, Learning by Discovery–An Example, Gestalt Psychology, Discovery, and Education, Discovery Learning, Criticism of Discovery Learning, Paradoxes in Discovery Learning, Influence of Different Types and Patterns of Guidance. Discovery Learning as Motivation, Synthesis, Synthesis a New Area for Research, Synthesis defined, Importance of Synthesis, Neglect of Synthesis, Synthesis Leads to Discovery, Synthesis Leads to New Sciences, Synthesis and System Engineering, Synthesis as a Predictor of Creative Achievement, Synthesis, An Educational Objective, and the Torrance Tests of Creative Thinking.

The individual concepts imbedded in the categories mentioned above are not elaborated upon to any appreciable degree. For example, in category (1) Gestalt Psychology, there are three sentences of discussion. It mentions but does not name the '...six conditions which Gestalt psychology considers important in producing visual form...' (p. 13). It names proximity as the most pertinent and refers to Katz and Kohler (1969) as agreeing with this premise of Gestalt psychology. In light of the claims made throughout the study (e.g., in connection with gestalten *qua* written materials, gestalten *qua* figural forms, gestalten *qua* theoretical structures, gestalten *qua* auditory phenomena, and so forth) it would be in order that those aspects of Gestalt psychology which tend to substantiate these claims would be presented in some coherent manner. This sort of treatment occurs, as has been noted, quite frequently throughout much of the study.

Perhaps even more objectional to the professional reader is that much of the material presented does not deal with analysis of the pertinent concepts but with promoting these concepts as someone in a public relations endeavor might do. For example, under the category (2) The Gestalten as Nonverbal Communication, an entire reference to a particular writer is contained in the following:

Hall's two books, The Silent Language (1959) and The Hidden Dimension (1966), deal with influence of non-verbal aspects of communication. Hall stresses the need for the incorporation of these concepts [unnamed] but is aware that, '...the educator will undoubtedly bristle under some of my criticisms.' It is Hall's '...hope that he (the educator) will find analysis in this book useful in its application to teaching' (p. 15).

It is difficult to see how this explicates Gestalten as nonverbal communication.

The system of reference notation used is very inadequate, e.g., some references in the text are put in parenthesis at the ends of sentences in the following manner: ...(Katz, 1950; Kohler, 1947; and Kofka, 1935). Hence, if a colleague found something of interest in the reference he might have to read the entire book (and in this case, perhaps even three books).

Research objectives. The stated purposes of this study were:

a) to analyze the relationship between the gestalten of the problem and the subject's response;

b) to test the power of the law of proximity as a means of encouraging the subject to synthesize.

The reader is asked to refer back to discussion under 'Statement of the Problem' in this review where the purposes are described in this reviewers own terms.

The investigator bases the hypothesis below on the principle of proximity:

Hypothesis 1. Subjects who receive the adaptation of the figural section of the Torrance Test of Creative Thinking (TTCT) which is structured so the squares present a paired gestalt (Appendix A) will be more fluent in their responses than subjects who receive the alternate adaptations of three or four squares to a horizontal line, spaced to appear as individual squares (Appendix A).

Hypothesis 2. Subjects who receive the adaptation of the figural section of the TTCT which is structured so the squares present a paired gestalt will make more synthesizing responses than subjects who receive the alternate adaptation in which the squares are spaced differently (Appendix A).

Hypothesis 3. Subjects receiving the adaptation of the figural section of the TTCT which structured so squares present a paired gestalt will utilize a greater number of squares in making the synthesis response than subjects receiving the alternate adaptations (Appendix A).

Hypothesis 4. The adaptation of the figural section of the TTCT which is structured so that the squares present a paired gestalt will encourage more subjects to synthesize than will the alternate adaptations.

A little commonsensical consideration of the first hypothesis could have shown the unlikelihood that it would be confirmed, as it subsequently was not. It is patent that it would generally take more time to think about, relate parts, and draw figures with more components of a specific type than drawings with less of those same type of components. One can only surmise that the investigator had in mind to include fluency in this study in order to somehow justify her assumptions of the connections between synthesis and creativity. I do not believe that this is an unreasonable assumption, but it is quite another thing to show what these assumed connections are (and this assumes that one agrees with Guilford that fluency is a necessary behavioral component of creative behavior). Also, note that there is no essential difference between Hypothesis 2 and Hypothesis 4. At best, Hypothesis 2 could imply Hypothesis 4 or vice versa. It is not clear how Hypothesis 3 enters into the study since syntheses were not weighted according to the number of squares included. This would mean that a drawing that included all the squares of one sheet would not receive a higher synthesis score than one that used only two squares. Hence, the power of a subject to combine many squares is penalized and is not reflected in this data. Another instance of the cavalier treatment of the logical aspects of this study.

Methodology. The hypotheses (listed above) were tested by applying three adaptations of the square version of the repeated figure test of the figural form of the Torrance Tests of Creative Thinking (TTCT) to 100 girls and 101 boys of the entire seventh grade of a junior high.

The first adaptation of the TTCT is organized so as to form eight pairs of squares while adaption number two has squares that are more equi-distant and further from each other so as not to suggest as much a grouping of some squares in relation to each other. The third adaptation suggests the individual squares by maintaining even greater and equal distances between squares. The tests were randomized and applied with a ten minute period that was observed by all subjects. Scoring consisted of giving a score of one for synthesis for each drawing that utilized more than one square. Fluency was scored by giving a score of one for each square that was utilized singly for one drawing or used as conjointly in a drawing utilizing more than one square.

Some of the less obvious variables were dealt with in the following manner:

> *An effort was made to reduce the influence of such extraneous variables as history, maturation, testing conditions, instrumentation and mortality, by testing all subjects at the same time in their regular homerooms. Care was taken that the different adaptations of the instrument were on paper from the same ream and were as similar as possible in format. Identical directions (Appendix B) were given for each of the adaptations (p. 44).*

It is difficult to see how testing at the same time would tend to neutralize the effects of such variables and others save mortality.

The means and standard deviations were computed for fluency, number of syntheses, and number of squares synthesized on hypotheses one, two, and three. A one-way analysis of variance was applied. For hypothesis four, a 3 x 2 Chi-square analysis was applied for each condition and the number of subjects synthesizing and not synthesizing. The statistical criterion was set at the .01 level of significance. Considering the relatively small population of the samples involved and the extensive assignment of such characteristics to diverse populations in the so-called implications, a more sophisticated approach that would permit more sensitive statistical analysis would have been more adequate. Chi-square, as an example of nonparametric tests, is not known to be the most sensitive of tests.[1] Nevertheless, the five and one-half pages which represent Chapter III (Research Methods and Procedures) contain the most straightforward and unambiguous discussion in this study.

Results and discussion. The first hypothesis was not confirmed, but rather '...subjects receiving the three squares to a horizontal line were more fluent than those receiving the other adaptations.' The second, third, and fourth hypotheses were confirmed.

The analysis included in Chapter IV (Discussion) of the findings is not very illuminating and in some instances plainly contradictory. For example, in discussing why the first hypothesis was not confirmed the investigator says: 'For one thing synthesis responses consume figures (squares, circles, etc.) rapidly' (p. 52). If this were true within the context of this study then it would follow that those who synthesized would consume more squares more rapidly and thus have higher fluency scores, as they most clearly did not. The investigator nevertheless surmises that it takes more time and 'creative energy' to synthesize, and with reservations on the 'creative energy' aspect, this appears to be the most pertinent inference given in connection with this. The discussion goes further in attempting to neutralize the importance of this apparent contradiction by quoting Torrance in regard to his assertion that figural fluency and flexibility have little meaning when considered alone. If this is the case, then there would seem to be no reason to include a hypothesis with meaningless results. Indeed, if the results of this study were taken seriously, then it would point that either synthesis and/or fluency might not be connected to creativity as considered here. The investigator does not make this obvious observation.

The investigator offers the following reason as to why there was increased fluency in the test adaptation that had three squares on the horizontal lines. She surmises that the spacious gestalt as opposed to the more crowded gestalt of the four to a horizontal line might have made the task seem easier thus increasing fluency. Yet we might point out that the paired adaptation was more spacious between pairs and there was no difference as compared to the four to a line adaptation.

The discussion offered here essentially comprises the entire analysis directly pertinent to the actual findings given by the investigator. The remainder of Chapter V titled 'Discussion' reads very much like the chapter dealing with the review of the literature. To deal with the remainder would be a matter of further pointing out logical inconsistencies, lack of interrelatedness, and unfounded broad inferences offered as implications. This will not be

prolonged, except to point out that the analysis promised by the title of this dissertation is scant in all of its dimensions.

Reviewers commentary. In all fairness to Werblo. she has attempted to deal with concepts whose logical underpinnings have yet to be spelled out, i.e., the concepts of creativity, discovery, the synthesizing thought processes, and so forth are subjects of much dispute. Surely, at least in equal dispute are the logical connections between these concepts. Nevertheless, it is one thing to deplore the lack of an adequate 'working definition' of discovery (p. 9), and another is to off-handedly suggest that researchers should pool their efforts and define such terms as does Werblo. I believe that this exemplifies one of the fallacies of eclectic approaches such as taken here. It is as if it is a matter of merely bringing diverse parts together, stirring lightly, and out comes the definition. It is really the business of the individual researcher to construct better definitions or temper their claimed findings in light of those inadequacies. It is a matter of great wonder to this reviewer how it can be helpful to deplore the lack of such a definition and then casually and contradictorily state in another context of the study:

> *...In the author's opinion, discovery does not mean complete lack of guidance but means carefully structured guidance which directs without dictating ... (p. 26).*

Nor could it be acceptable to offer what the investigator presumably considers an adequate definition of synthesis in one place (p. 10) and then differently state elsewhere (p. 30) that '...Synthesis may also be defined by giving words that will elicit the desired response... .' Such an approach reduces the problem of adequate definitions to what is tantamount to a matter 'of paying your money and taking your choice.'

If the reader experiences a great deal of confusion in pondering this study, be assured that it is not all his fault. Consider that the investigator alternately states the following:

a) that some adults and children have a tendency to view the world in an interrelated manner (p. 19, Surely, it is safe to assume that most of us do so to some degree);

b) the synthesis principle works even without the synectics training (p. 36); and

c) there is little transfer of training unless there is training for transfer (p. 60).

Add to the above what the writer whimsically attaches to the end of her study (in regard to some scholars that have made their greatest contribution outside their chosen fields) the rhetorical question which follows:

> *Wouldn't it be wonderful if we could structure learning so more could utilize with ease what formerly only those with great ability could accomplish [i.e., synthesize, (p. 68)].*

If the apparent contradictions of the above items are not resolved in the context of their discussion for the reader, then he has found one of the many causes of his confusion. This has been the case for this reviewer much too often throughout his ponderings of the study.

This reviewer cannot offer any way in which research of creativity (and accompanying concepts mentioned in this study) can be advanced by the replication of this study. It would first be necessary to absolve a great deal of theoretical confusion imbedded in the approach taken and in the interpretation of data gained in this dissertation.

In the attempt to be a constructive critic, I would like to offer some ideas in terms of some theoretical considerations that might be of use. It would seem in order for Werblo, in light of the mentioned contradictory results, to sort out some of the theoretical assumptions imbedded in the various conjectures therein. For example, a careful scrutiny of Torrance's characterization of fluency is in order, *viz.*, 'Fluency is simply the number of responses minus the number of duplications and irrelevant responses.' Scoring fluency is of course a simple thing as Torrance states if one does not ask for the criteria by which responses are judged as relevant or irrelevant' (p. 10). To this reviewer's knowledge, Guilford does nowhere stipulate such criteria but rather attributes utmost importance to sheer quantity of responses.[2] Nor to my knowledge does Torrance extend Guilford's theory in this sense either. If it is the case that Torrance has

established such adequate criteria. then this would constitute an important extension of Guilford's theory of Fluency. Hence. if such criteria exists, then it should be stated and brought to work in this study and other research. Other important theoretical groundwork to be laid out might be to stipulate the theoretical fitness of synthesis and gestalten with Guilford's model of the 'Structure of Intellect (SI).' No clear parallels between synthesis and gestalten as defined here are shown with components of the SI model nor mention of whether or how the SI model theory is extended. This would be a necessary consideration to give meaning to findings according to the theory where fluency *qua* creativity is itself given meaning. The limitations of Guilford's theory, as it applies to this study, should be sought as well. There exists literature in which doubt is cast as to the comprehensiveness of his 'Comprehensive Theory of Intellect' and his model of problem solving based on it.[3] There is also logical-theoretical analysis available that makes it clear that some categories therein are ambiguous to some considerable extent.[4] Findings of studies based on such theories are made unambiguous to the extent that clarification of such theoretical aspects are taken into consideration and/or limitations are set on such studies in light of these theoretical inadequacies.

FOOTNOTES

1. Janet T. Spence, *Elementary Statistics* (second edition), (New York: Appleton-Century Crafts, 1968), p. 209.
2. J.P. Guilford, 'Traits of Creativity,' *Creativity and its Cultivation: Addresses Presented at the Interdisciplinary Symposia on Creativity,* Michigan State University, East Lansing, Michigan, edited by H.H. Anderson (New York: Harper & Brothers Publishers, 1959), p. 143.
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REVIEWER

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In addition, this issue will feature an integrative review by the editors dealing with preference for visual arts stimuli.